

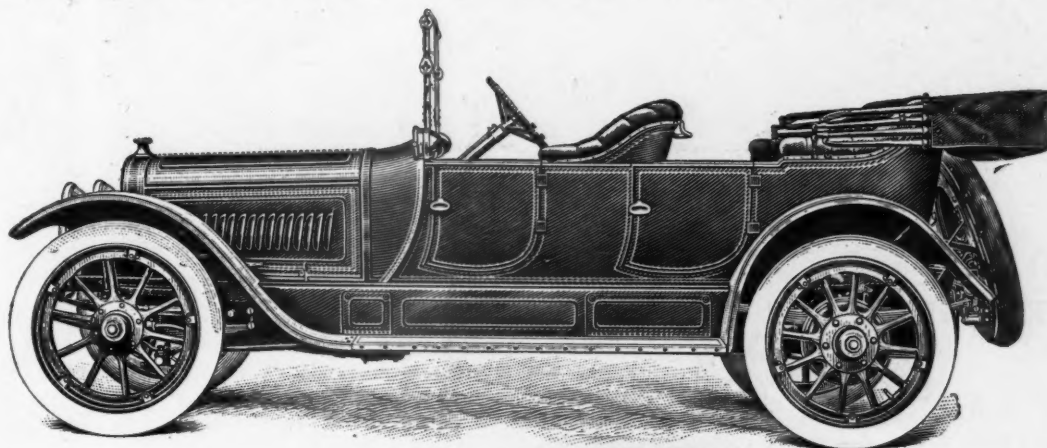
# MOTOR AGE

VOLUME XXII

CHICAGO, NOVEMBER 28, 1912

NUMBER 22

## Instantaneous Success



**\$3250 LOZIER \$3250**  
**"LIGHT SIX"**

We told you a month ago that the Lozier agency would be the most valuable agency of the year. We thought so. Now we know it. And our dealers know it.

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Since the announcement of the "LIGHT SIX" two months ago we have closed

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This is an opportunity that you cannot afford to put off.

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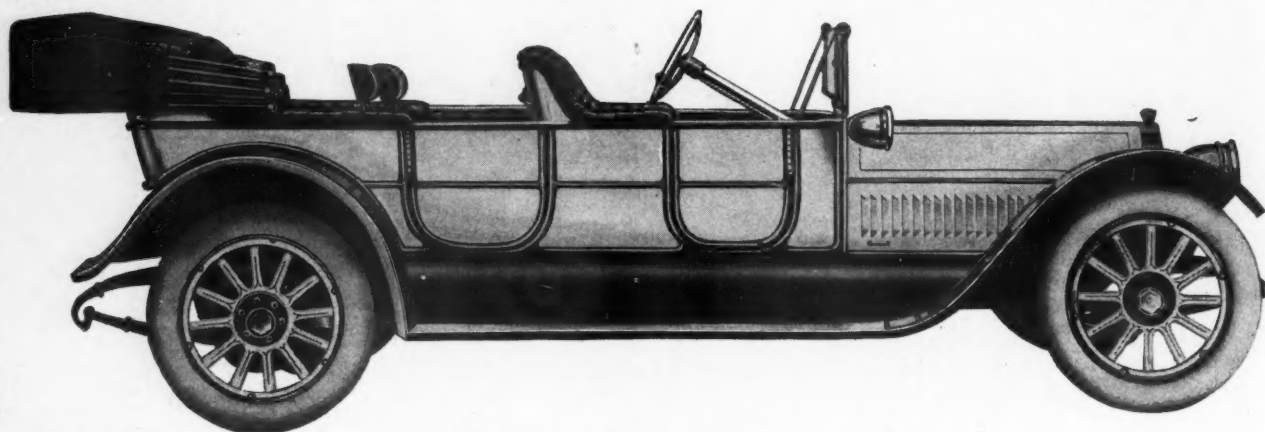
**LOZIER MOTOR COMPANY, Box 719, Detroit, Mich.**



# AUSTIN



HAS MORE DISTINCTIVE FEATURES THAN ANY OTHER CAR



## MOTOR

## SELF STARTER

## IGNITION

## LEFT-HAND STEER

## CENTER CONTROL

## CUSHION SPRINGS

## BOTH BRAKES ARE CONTROLLED BY FOOT PEDALS

## ELECTRIC LIGHTING

## NINE PASSENGER BODY

## 6 cylinders. 4½" bore, 7" stroke.

High-pressure air system, having a special air pump maintaining 150 lbs. pressure in a large tank from which there is also a connection for instantly filling tires with pure air.

Two sets of spark plugs, with double spark dual magneto, firing each set separately or both sets of plugs at the same time.

With right-hand center control, giving a much quicker view of the road ahead when passing any vehicle, and allowing the use of both front doors.

Transmission, selective type. Four forward speeds. The center control lever is very short, and has a ball and socket joint at the floor connection, eliminating all holes or slots in the floor. The segment and also the clutch interlocking device are absolutely positive and are entirely enclosed in the transmission case.

Entirely new double construction. Exceedingly soft and flexible, and still very strong and durable.

A slight movement of the clutch pedal entirely releases the clutch and at the same time takes up the slack of the emergency brake which is fully engaged by a further movement of the clutch pedal. The service brakes are also operated by a foot pedal. This arrangement eliminates the hand brake lever and enables the operator to handle both clutch and brake with one foot when desired, leaving the other foot free to operate either the exhaust horn or accelerator. Also, both brakes can be applied instantly without taking either hand from the wheel.

Powerful Generator, driven by enclosed gear, furnishing 20 amperes at moderate speed. 32-c.p. Head Lights, 16-c.p. Side Lights and 4-c.p. Tail Light. A combination switch controlling all lights as desired, including a dimmer for the head lights. Edison Storage Battery.

Can be furnished at a small extra cost.

*Write for our special introductory proposition to agents and owners in unoccupied territory.*

Model "77"	4½ x 7	\$6000.00
Model "66"	4½ x 5½	5000.00
Model "55"	4 x 5	4000.00

**Austin Automobile Company,**

**Grand Rapids, Mich.**





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Volume XXII

NOVEMBER 28, 1912

No. 22

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**True  
Merit  
and Real  
Value Now  
Recognized**

The only Anti-Skid device which can be relied upon and the only one in which absolute confidence can be placed.

Proven to be a necessity and not a luxury.

## Weed Chains

"With the Creeping Grip"

No car is safe without them. They have stood the test of time and are regarded as the most important and profitable accessory handled and sold by automobile dealers. Victory after victory has perched on the banner of Weed Chains.

The courts, in emphatic language, after carefully considering the facts, have in numerous cases issued injunctions, restraining infringers from manufacturing or selling their infringing devices. Weed Chains are the only genuine Anti-Skid device—All others are infringements.

### Join today the army of "Anti-Skidders"

Consider your own safety—Consider the safety of other road users. Take no chances.

Wise motorists are victorious in overcoming skidding accidents by the use of Weed Chains.

Cannot injure tires because they creep. Absolutely necessary on wet and greasy pavements, or on muddy, slippery roads. By our new, secret process of hardening, just adopted, the cross sections are more perfect and wear better than ever before. Packed and shipped in canvas bags.

Equip your own car with Weed Chains and insist, for your own protection, that other drivers do the same.

Recommended and sold  
by all reputable dealers.

Weed Chain Tire Grip Co.  
28 Moore St. New York City



# The White Berline Limousine

The Latest Production of the Most Progressive  
Motor Car Company of America

**T**HE White Berline marks the highest development of the modern motor car, both in beauty of body design, and merit of chassis construction. Every small detail which adds to comfort, convenience, and safety of operation has been carefully and successfully executed.

The logical combination of left-side drive with right-hand control, places the driver in the proper position to handle the car with the greatest amount of safety in traffic, a very important factor in closed cars. The left-side position of the steering wheel, together with the White Electrical Starting and Lighting System, makes it possible to reach the driving seat, start, and light the car without the necessity of stepping into the street. When the services of the chauffeur are not required, the glass partition back of the driving seat can be instantly dropped out of sight, throwing the entire interior into one compartment.

White Berline Limousines are built in Forty and Sixty horse-power models.

**The White  Company**  
CLEVELAND

Manufacturers of  
Gasoline Motor Cars,  
Trucks and Taxicabs.



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# MOTOR AGE

## One Thousand Miles Through Colorado

### Part 3-Across the Black Mesa

by John P. Dods

THE Grand Junction people admitted that with the conditions as they were at that time we would have considerable difficulty in getting through; furthermore, very little had been done by the Utah people, and if we should spend Sunday going out into Utah to see just what shape the road was in and could notify the proper people in Utah of these conditions it would serve to stimulate them to immediate action if they wished to do their part in getting a link of the transcontinental route. We had heard previously that with the improvements made through efforts of Grand Junction people we probably could have reached Salt Lake in 3 or 4 days, but as it was, we were told it might take us over a week unless we had the best of luck. Grand Junction offered to cooperate in helping to

send another car through a month later, when conditions had been improved again, and the Blue Book company offered to send out a representative to take the data and gather information relative to tourist conditions. All phases of the situation were carefully discussed and the above plan decided upon. Therefore, Sunday morning we started out for the Utah line with an escort of two cars from Grand Junction.

The first 15.5 miles to Fruita was through the wonderful orchards of this section, giving us another opportunity of seeing the great productiveness of irrigated land. Just beyond Fruita we came into full view of the desert and along the railroad to Loma, 20.8 miles, running onto the old railroad grade. One can hardly believe that in a few years' time what we



ON THE PLATEAU ABOVE COPPER GULCH, SANGRE DE CRISTO RANGE IN DISTANCE

AMONG THE QUAKING ASPENS ON TOP OF THE BLACK MESA IN VICINITY OF HOTCHKISS





SNOW-CLAD PEAKS OF SANGRE DE CRISTO RANGE

were passing through would be orchards similar to those nearer Grand Junction. This is practically an assured fact, as the Highline irrigation ditch, which will give water to all these lands, is now in actual process of construction.

#### The Utah Line

At Mack, 24 miles out, we only stopped a few moments to fill our water bags, and then left the hard road for the more sandy, winding and typical desert road. We went out to the Utah line about 15 miles beyond and, although we had no serious difficulty, we clearly saw that before this section of the route could be counted in on a transcontinental connection considerable improvements must be made. There is no doubt whatever but that the Grand Junction people will not only see that road conditions are kept up as far as the state line, but they further propose to establish telephone boxes at frequent intervals all along this route until it strikes the railroad again at Cisco. In the end they will probably establish a road all the way to Cisco, and in all probability beyond on top of the old abandoned railroad grade formerly used by the D. & R. G. There are gaps on this old embankment where bridges used to be, but these easily can be gotten around by dropping down off the embankment and up again.

By using this old grade the sandy stretches for 100 miles will be eliminated and also an enormous number of dry washes. The use of this old grade will mean that tourists can easily make the 125 miles between Grand Junction and Green River in a day and probably farther, although this is sure to be a natural stopping point, due to lack of accommodations

between there and Price. Later in the year we will have more definite information on the Utah end and full details will be given at that time. Returning to Grand Junction we stopped at Mack for lunch, as the branch railroad up to the gypsum mines at Dragon maintains an excellent little hotel here.

#### Washouts Negotiated

On Monday morning we started out for Delta, the first stop on our return trip. We found that on the first 30 miles road conditions were not very good, for the numerous washouts made fast going dangerous. Of course all of these had been caused by the recent rains and repairs had not been completed. The Grand Junction and Delta people are planning to change the line of this road in many places to bring it up higher on the side of the mesa to avoid such washouts and, in other places, to put in concrete aprons which will protect the highway in times of high water.

Just outside of Delta we were met by an escort and stopped long enough there to get a hasty lunch and confer with a delegation from Montrose. It seems that there



THE DEPTHS OF THE ROYAL GORGE

is very keen rivalry between the Montrose and Delta county boosters as to which way the official route shall go. The one via Montrose must cross the Blue mesa between that point and Gunnison and the one in Delta county via Hotchkiss must cross the Black mesa, the first on the south



side of the Gunnison river, the latter to the north. The Montrose people were frank in stating that under present conditions they would not advise driving over the Blue mesa for a distance of about 15 miles. They had everything ready for us to ship our car should we decide to go that way. The Delta people, however, persuaded us that although the new road over the Black mesa had not been fully completed so we could use it we would be able to get over the mesa on the old road.

They were candid, however, in stating we might need some assistance, as there was a rise of nearly 1,600 feet in 5 miles, with many sharp turns, in one spot a 28 per cent grade.

#### At Foot of Black Mesa

We made our start for Hotchkiss, 23 miles beyond. A short stop was made in Hotchkiss, when we started out for the foot of the Black mesa via Crawford. We arrived at Ritchie's ranch, 90 miles from Grand Junction at the foot of the mesa, about 4 o'clock, and decided to stay here all night and get an early start in the morning. The roads from Delta had been very good, most of them having been recently regraded, and there were very few grades exceeding 10 per cent. A considerable part of this section is under irrigation, with many fine orchards, though the last few miles from Crawford was in a much newer country where most of the farming consisted of cattle raising, grain and hay. We were now at an altitude of about

9,000 feet, therefore the temperature was sure to be considerably below freezing during the night. The climb over the Black mesa in the morning would be made easier by the surface being frozen hard.

We were up bright and early on Tuesday morning and away from the ranch before 7 o'clock. The first two miles of the climb gave no difficulty, but before we were half way up we began to get into considerable snow and ice.

The road was rough, narrow and sidling even on the sharp turns, and when we finally reached the top at 11 o'clock we felt that nothing in the way of roads that we could ever see again would quite equal it. Our chains had been torn to pieces by the wheels spinning on the ice. Due to the steep pitches and sliding nature of the road we had trouble at one or two places in getting proper pressure on gasoline and were mighty glad to get up the hill with a whole car. In fact, no car should ever be sent over such roads and nothing but the very best of material would have stood what our White went through. The altitude now was over 10,500 feet and there was very little drop for a considerable distance, as this old road winds along on top of the mesa, some parts of it being through heavy spruce timber and quaking asps so close to the trees in places that we had to be very careful to get through.

#### In the Depths of the Canyon

Road conditions, however, were fairly good and we naturally thought that all the bad part was over, but at mileage 100.0 we came into view of the Black canyon of the Gunnison and began a rocky downgrade that made us stop and wonder



ABOVE, ENTERING THE CANYON ABOVE COTOPAXI. BELOW, ON TOP OF MONARCH PASS, ALTITUDE 11,850 FEET



if we would ever get over it. The road was narrow and full of rocks all over the road-bed. Those on the sides were so close we expected to see a tire torn off any minute. Some of those in the center of the road were so high that we were afraid we would be stopped by one hitting our differential housing. We were finally over it, however, and this, as it proved, was the last of our bad roads.

From here almost all the way into Sapinero the road followed quite closely along the top of the Black canyon of the Gunnison. Most of this is pretty good now, although it should be widened or turnouts provided at frequent intervals. In many respects the road winds along similar to the road along Battle mountain above Eagle canyon, which we had followed out of Redcliff. Here, however, the distance to the river was even greater, but we were not quite so close to the edge. Nevertheless, we had many thrillers and Lazarnick, who was in the outside seat in the tonneau, maintained after the ride that at some points he could look straight down for 2,000 feet.

#### Curecanti Needle

At about 105 miles we crossed Curecanti creek and just beyond got out of the car to walk over to the edge of the canyon, where we had an excellent view of the Curecanti Needle. This is a lone rock towering 1,000 feet high above the river on the south side.

We reached Sapinero at 4 o'clock, 114 miles from Grand Junction, so that we had only made 24 miles from Richie's ranch. Most of our time, however, had been lost in getting over the Black mesa. At Sapinero a car from Gunnison met us and acted as our escort the rest of the way in. The road from here on was good for the most part, some of it being like a boulevard, and following along the river. We had abundant proof of the wonderful reputation Gunnison has for fishing, as we were continually passing permanent fishing camps, which, they told us, were occupied all the time during the season.

Gunnison is 139.5 miles from Grand Junction over the road we came and next year with the new grade completed by way of either Montrose or Hotchkiss this should be an easy day's run with plenty of opportunity to stop along the way for pictures, etc.

The next morning the party from Gunnison again acted as pilot and we started out expecting that we probably would have some trouble getting over Monarch pass. We found, however, that the road practically all the way to the foot of the pass was well graded and 15 miles of it dragged. Further, County Commissioner Wiley had just completed up the west

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FROM TOP TO BOTTOM: ONLY FORD ON TRIP, CROSSING TEXAS CREEK; THE BLACK CANYON OF THE GUNNISON; BROKEN DOWN PRAIRIE SCHOONER HALTS TOURISTS; NEARING TOP OF MONARCH PASS



side of the pass a new grade that was one of the finest stretches we were on in all our trip. They told us they were going to shorten the route between Gunnison and Monarch considerably in another year or so, but we went via Sargent, 34 miles from Gunnison, making the distance to the foot of the climb 40.6 miles. This climb to the top of the Monarch is nearly 6 miles long with continuous upgrade. Although the ground most of the way was wet from melting snow, we had no difficulty whatever even without tire chains on a new road. We were stopped continually to take in the wonderful views, particularly back of us, where range after range came into sight as we got up higher. The peak that set up out above all, as it was nearest to us, was the Ouray, although the many peaks of the San Juan and Uncompahgre ranges stand out prominently. When we reached the top at mileage 46.2 they were all fairly gasping with the magnificence of the continually changing view. We were then at an altitude of 11,650 feet.

#### Descending Continental Divide

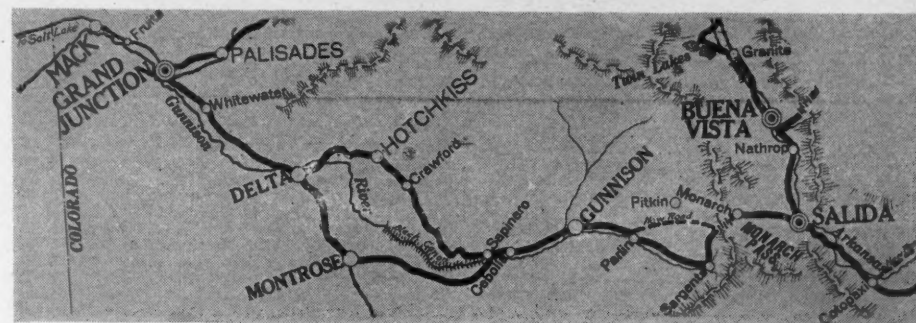
Leaving the top we again began the descent of the continental divide and found road conditions on the eastern side of the pass to be much in need of improvement. However, they told us later in Salida that all of this was planned and would be actually improved for next year. The road, even as it is, was nothing to some stretches we had been over, but local people are anxious to put it in as good shape as the grade on the western side.

The ride down through Monarch, an old mining town 50.3 miles from Gunnison, was over a fine road all the way to Salida, 69.4 miles, along the south fork of the Arkansas. The altitude at Salida is only a little over 7,000 feet, so that we had come down almost 5,000 feet in 23 miles. We had arrived here before 3 o'clock, so after a hurried lunch we went up to Buena Vista and back in order to tie in our route matter with that taken the previous week. We made the 50 miles up and back in just 2 hours.

During the evening we had the opportunity of meeting a good many of the Salida people and will always have a good word for this hustling little town because of the people, and on account of its wonderful location in the beautiful Arkansas valley. Although roads radiate out of Salida in practically all directions, in coming down the valley from Buena Vista it gives one the appearance of being located in a pocket of mountains with the Sangre de Cristo range on the south, Saguache range on the west and Park range on the east.

(To be Concluded)

FROM TOP TO BOTTOM: MOUNTAINS NEAR SALIDA; CONVICT ROAD TO TOP OF ROYAL GORGE; BEGINNING CLIMB OVER MONARCH PASS; MAP OF THE ROUTE BETWEEN GRAND JUNCTION AND SALIDA



# Chicago Show Space Assigned by Miles

CHICAGO, Nov. 25—Closing his books, Samuel A. Miles, general manager of the National Association of Automobile Manufacturers, announces every inch of space in the pleasure car show at Chicago has been sold, while everything in the commercial show is sold except some spaces in the basement. Ninety-six pleasure car makers will exhibit, while there are to be sixty-two commercial exhibits. The Coliseum proper will house thirty-nine makers the first week and thirty-four truckmen the second week; in the annex there will be eight pleasure car displays and nine trucks; the armory will take care of thirty-one makes of pleasure cars and nineteen trucks, while eighteen pleasure-car makers will be in the Coliseum basement.

## ATLANTA SHOW MADE MONEY

Atlanta, Ga., Nov. 23—The Atlanta show ended tonight. The accounts have not been cast yet, but it appears that enough money will be in the treasury to pay all expenses, refund to each exhibitor one-half of the money he spent for space and still leave \$2,500 in the treasury for a working fund.

The show was more economically run

## Ninety-Six Pleasure Car Makers and Sixty-Two Truck Concerns In

this year than last, but, thanks to good weather, to prosperity in the south, to the fine display of cars and to much publicity and because it was given right at the start of the southern buying season, it drew immeasurably larger crowds than ever before.

A feature of the show was the announcement made while it was in progress that two new southern branch houses would be opened in Atlanta—the Cartercar and the Jackson. Both will have show rooms on Peachtree street and service stations elsewhere. This will give Atlanta seventeen direct factory branches.

A census of the show gave 104 cars on exhibition.

## TOLEDO WOULD MOTORIZE

Toledo, O., Nov. 25—Safety Director J. J. Mooney has requested the council to authorize the motorizing of Toledo's fire department, and that body now has the matter under advisement. The cost of the

undertaking is estimated at \$185,000, and it is estimated that the cost of operation would pay the interest on the debt and wipe out the indebtedness in 15 years. According to Mr. Mooney, there are between 106 and 112 horses in the department, maintained at an annual expense of \$25,000. Fire Chief Mayo estimates that better service can be maintained with thirty-four pieces of motor-driven apparatus than with forty-five horse-drawn vehicles.

## INDIANAPOLIS PROGRESSIVE

Indianapolis, Ind., Nov. 23—In a report covering a survey of the fire-fighting facilities of Indianapolis, the National Board of Fire Underwriters has recommended that all new apparatus bought for the department and all apparatus of companies making long runs on the first alarm shall be motor apparatus. The city has already adopted a policy of buying motor apparatus as new apparatus is needed and to gradually displace horse-drawn apparatus. Several pieces of motor apparatus have been in use in the department for some time and have given excellent satisfaction.

## Pleasure and Commercial Vehicle Manufacturers Who Will Exhibit at Chicago

### PASSENGER VEHICLE DEPARTMENT — COLISEUM, MAIN FLOOR

Winto Motor Carriage Co. .... Cleveland, O.  
F. B. Stearns Co. .... Cleveland, O.  
Dayton Motor Car Co. .... New York City  
Stevens-Duryea Co. .... Chicopee Falls, Mass.  
Flanders Motor Co. .... Detroit, Mich.  
Peerless Motor Car Co. .... Cleveland, O.  
Bartholomew Co. .... Peoria, Ill.  
Buick Motor Co. .... Flint, Mich.  
Reo Motor Car Co. .... Lansing, Mich.  
Studebaker Corporation. .... Detroit, Mich.  
H. H. Franklin Mfg. Co. .... Syracuse, N. Y.  
Locomobile Co. of America. .... Bridgeport, Conn.  
Packard Motor Car Co. .... Detroit, Mich.  
National Motor Vehicle Co. .... Indianapolis, Ind.  
Premier Motor Mfg. Co. .... Indianapolis, Ind.  
Hudson Motor Car Co. .... Detroit, Mich.  
Haynes Automobile Co. .... Kokomo, Ind.  
Pierce-Arrow Motor Car Co. .... Buffalo, N. Y.  
Cadillac Motor Car Co. .... Detroit, Mich.  
Maxwell-Briscoe Motor Co. .... New York City  
Pope Mfg. Co. .... Hartford, Conn.  
Willys-Overland Co. .... Toledo, O.  
Olds Motor Works. .... Lansing, Mich.  
Chalmers Motor Co. .... Detroit, Mich.  
Auburn Automobile Co. .... Auburn, Ind.  
Thomas B. Jeffery Co. .... Kenosha, Wis.  
Fiat. .... Poughkeepsie, N. Y.  
Nordyke & Marmon Co. .... Indianapolis, Ind.  
American Locomotive Co. .... New York City  
White Co. .... Cleveland, O.  
Cole Motor Car Co. .... Indianapolis, Ind.  
Pierce Motor Co. .... Racine, Wis.  
Columbia Motor Car Co. .... New York City  
Selden Motor Vehicle Co. .... Rochester, N. Y.  
Lozier Motor Co. .... Detroit, Mich.  
Oakland Motor Car Co. .... Pontiac, Mich.  
Moon Motor Car Co. .... St. Louis, Mo.  
Mitchell-Lewis Motor Car Co. .... Racine, Wis.  
Imperial Automobile Co. .... Jackson, Mich.

### COLISEUM ANNEX, MAIN FLOOR

Kissel Motor Car Co. .... Hartford, Wis.  
American Motors Co. .... Indianapolis, Ind.  
Hupp Motor Car Co. .... Detroit, Mich.  
Garford Co. .... Elyria, O.  
Cartercar Co. .... Pontiac, Mich.  
Knox Automobile Co. .... Springfield, Mass.  
Velle Motor Vehicle Co. .... Moline, Ill.  
Inter-State Automobile Co. .... Muncie, Ind.

### FIRST REGIMENT, MAIN FLOOR

Borland-Grannis Co. .... Chicago  
Waverley Co. .... Indianapolis, Ind.  
Flanders Mfg. Co. .... Detroit, Mich.  
Ohio Electric Car Co. .... Toledo, O.  
Argo Electric Vehicle Co. .... Saginaw, Mich.  
Baker Motor Vehicle Co. .... Cleveland, O.  
Columbus Buggy Co. .... Columbus, O.

Anderson Electric Car Co. .... Detroit, Mich.  
Woods Motor Vehicle Co. .... Chicago  
Jackson Automobile Co. .... Jackson, Mich.  
Rauch & Lang Carriage Co. .... Cleveland, O.  
Moline Automobile Co. .... East Moline, Ill.  
Buffalo Electric Vehicle Co. .... Buffalo, N. Y.  
Austin Automobile Co. .... Grand Rapids, Mich.  
Broc Electric Vehicle Co. .... Cleveland, O.  
Matheson Automobile Co. .... Wilkes-Barre, Pa.  
Staver Carriage Co. .... Chicago  
Pullman Motor Car Co. .... York, Pa.  
Krit Motor Car Co. .... Detroit, Mich.  
Westcott Motor Car Co. .... Richmond, Ind.  
McFarlan Motor Car Co. .... Connorsville, Ind.  
Great Western Automobile Co. .... Peru, Ind.  
Speedwell Motor Car Co. .... Dayton, O.  
Ideal Motor Car Co. .... Indianapolis, Ind.  
Abbott Motor Co. .... Detroit, Mich.  
Michigan Motor Car Co. .... Kalamazoo, Mich.  
Regal Motor Car Co. .... Detroit, Mich.  
Cutting Motor Car Co. .... Jackson, Mich.  
Kline Motor Car Corporation. .... Richmond, Va.  
Motor Car Mfg. Co. .... Indianapolis, Ind.  
Paige-Detroit Motor Car Co. .... Detroit, Mich.

### COLISEUM BASEMENT

Edwards Motor Car Co. .... New York  
Herreshoff Motor Co. .... Detroit, Mich.  
Norwalk Motor Car Co. .... Martinsburg, W. Va.  
Metz Co. .... Waltham, Mass.  
D. J. Bergdoll Motor Co. .... Philadelphia, Pa.  
George W. Davis Carriage Co. .... Richmond, Ind.  
Elkhart Carriage & Harness Mfg. Co. .... Elkhart, Ind.

Midland Motor Co. .... Chicago  
Chicago Electric Motor Car Co. .... Chicago  
Crow Motor Car Co. .... Elkhart, Ind.  
W. H. McIntyre Co. .... Auburn, Ind.  
Standard Electric Car Co. .... Jackson, Mich.  
Colby Motor Co. .... Mason City, Ia.  
W. A. Paterson Co. .... Flint, Mich.  
Marathon Motor Works. .... Nashville, Tenn.  
Henderson Motor Car Co. .... Indianapolis, Ind.  
Church-Field Motor Co. .... Sibley, Mich.  
Mercer Automobile Co. .... Trenton, N. J.

### COMMERCIAL VEHICLE SECTION—FIVE COLISEUM, MAIN FLOOR

Studebaker Corporation. .... Detroit, Mich.  
Autocar Co. .... Ardmore, Pa.  
Thomas B. Jeffery Co. .... Kenosha, Wis.  
Selden Motor Vehicle Co. .... Rochester, N. Y.  
Buffalo Electric Vehicle Co. .... Buffalo, N. Y.  
Reo Motor Car Co. .... Lansing, Mich.  
Federal Motor Truck Co. .... Detroit, Mich.  
Velle Motor Vehicle Co. .... Moline, Ill.  
Hupp Motor Car Co. .... Detroit, Mich.  
Buick Motor Co. .... Chicago  
Kelly Motor Truck Co. .... Springfield, O.

Peerless Motor Car Co. .... Cleveland, O.  
Kissel Motor Car Co. .... Hartford, Wis.  
International Motor Co. .... New York City  
Adams Bros. Co. .... Findley, O.  
Speedwell Motor Car Co. .... Dayton, O.  
Waverley Co. .... Indianapolis, Ind.  
Locomobile Co. of America. .... Bridgeport, Conn.  
Gramm Motor Truck Co. .... Lima, O.  
Pierce-Arrow Motor Car Co. .... Buffalo, N. Y.  
Pope Mfg. Co. .... Hartford, Conn.  
American Locomotive Co. .... New York City  
Walker Vehicle Co. .... Chicago  
U. S. Motor Truck Co. .... Cincinnati, O.  
Garford Co. .... Elyria, O.  
General Motors Truck Co. .... Pontiac, Mich.  
Relliance Motor Truck Co. .... Pontiac, Mich.  
Knox Automobile Co. .... Springfield, Mass.  
Krebs Commercial Car Co. .... Clyde, O.  
Clark Delivery Car Co. .... Chicago  
Old Reliable Motor Truck Co. .... Chicago  
Durant-Dort Carriage Co. .... Flint, Mich.  
Car Dept. .... Flint, Mich.  
Dayton Auto Truck Co. .... Dayton, O.  
Sternberg Mfg. Co. .... Milwaukee, Wis.

### COLISEUM ANNEX, MAIN FLOOR

Chase Motor Truck Co. .... New York City  
Service Motor Car Co. .... Wabash, Ind.  
Standard Motor Truck Co. .... Detroit, Mich.  
Transit Motor Truck Co., Inc. .... Louisville, Ky.  
Dart Mfg. Co. .... Waterloo, Ia.  
M. & P. Electric Vehicle Co. .... Detroit, Mich.  
Lippard-Stewart Motor Car Co. .... Buffalo, N. Y.  
Universal Motor Truck Co. .... Detroit, Mich.  
Bowling Green Motor Car Co. .... Bowling Green, O.

### FIRST REGIMENT ARMORY, FIRST FLOOR

General Vehicle Co. .... Long Island City, N. Y.  
Avery Co. .... Peoria, Ill.  
Packard Motor Car Co. .... Detroit, Mich.  
White Co. .... Cleveland, O.  
Baker Motor Vehicle Co. .... Cleveland, O.  
A. O. Smith Co. .... Milwaukee, Wis.  
Schacht Motor Car Co. .... Cincinnati, O.  
Lauth-Juergens Motor Car Co. .... Fremont, O.  
Chicago Pneumatic Tool Co. .... Chicago  
National Motor Truck Co. .... Bay City, Mich.  
Sanford Motor Truck Co. .... Syracuse, N. Y.  
International Harvester Co. .... Chicago  
Commerce Motor Car Co. .... Detroit, Mich.  
Brown Commercial Car Co. .... Peru, Ind.  
Four Wheel Drive Automobile Co. .... Clintonville, Wis.  
Hardwood-Barley Mfg. Co. .... Marion, Ind.  
Bessener Motor Truck Co. .... Grove City, Pa.  
D. F. Poyer & Co. .... Menominee, Mich.  
Gramm-Bernstein Co. .... Lima, O.



# Beautify Garden and Palace for Show

NEW YORK, Nov. 25—In order to make the new Grand Central palace more attractive and appropriate for a motor show than ever before, the entire interior, including all of the floors, is to be redecorated for the national motor car show, January 11 to 25 next. Madison Square garden also will have an entirely new scheme of decoration. On the walls of the main floor of the palace will be several Long Island scenes, a view of the magnificent Delaware Water Gap, views in the Berkshires, and a painting of scenes along the Hudson at West Point. On the mezzanine floor western views will be found,

## New Yorkers Lavish in Decorating the Two Big Buildings

including the Grand canyon of the Colorado, gorges and passes in the Rocky mountains, California vistas, sections of the cattle country and prairies. The balcony will be devoted to the sunny south and paintings of the famous beach at Ormond, Fla., where numerous world's speed records were made, Savannah and other Dixie points of interest will be depicted.

These paintings will adorn the walls about the picturesque pergola setting in which the cars are to be shown. There will be much trellis work, flowers in profusion, and a general outdoor atmosphere in which the cars will show to advantage.

Details of the Madison Square garden decorations have not been made public, but the color scheme is to be worked out in gold and white.

There will be an added feature at the New York show. During the second week, beginning January 20, which is devoted to commercial vehicles, it has been decided to hold a machine tool exhibit.

## List of Accessory Concerns Which Will Exhibit Both Weeks of the Chicago Show

### COMMERCIAL VEHICLE SECTION—PASSENGER VEHICLE SECTION COLISEUM GALLERY

Havoline Oil Co. .... New York  
Chicago Drop Forge & Fdy. Co. .... Chicago  
Rutenber Motor Co. .... Marion, Ind.  
Imperial Brass Mfg. Co. .... Chicago  
Standard Roller Bearing Co. Philadelphia, Pa.  
Atwater-Kent Mfg. Wks. .... Philadelphia, Pa.  
C. F. Ham Mfg. Co. .... Rochester, N. Y.  
Lefever Arms Co. .... Syracuse, N. Y.  
Globe Machine & Stamping Co. .... Cleveland, O.  
U. S. Light & Heating Co. .... New York  
N. Y. & N. J. Lubricant Co. .... New York  
Weed Chain Tire & Grip Co. .... New York  
Vesta Accumulator Co. .... Chicago  
Whitney Mfg. Co. .... Hartford, Ct.  
Heinze Electric Co. .... Lowell, Mass.  
Warner Instrument Co. .... Beloit, Mich.  
Ajax-Grieb Rubber Co. .... New York  
A. O. Smith Co. .... Milwaukee, Wis.  
McCord Mfg. Co. .... Detroit, Mich.  
Republic Rubber Co. .... Youngstown, O.  
Joseph Dixon Crucible Co. .... Jersey City, N. J.  
Hyatt Roller Bearing Co. .... Newark, N. J.  
Motz Tire & Rubber Co. .... Akron, O.  
Wm. Cramp & Sons Eng. Co. .... Philadelphia, Pa.  
Timken-Detroit Axle Co. .... Detroit, Mich.  
Timken Roller Bearing Co. .... Canton, O.  
Flsk Rubber Co. .... Chicopee Falls, Mass.  
Badger Brass Mfg. Co. .... Kenosha, Wis.  
Goodyear Tire & Rubber Co. .... Akron, O.  
Veeder Mfg. Co. .... Hartford, Ct.  
U. S. Tire Co. .... New York  
Gray & Davis. .... Amesbury, Mass.  
B. F. Goodrich Co. .... Akron, O.  
Standard Welding Co. .... Cleveland, O.  
National Tube Co. .... Pittsburgh, Pa.  
Motsinger Device Mfg. Co. .... Pendleton, O.  
Warner Gear Co. .... Muncie, Ind.  
Splittorf Electrical Co. .... Newark, N. J.  
Diamond Chain & Mfg. Co. .... Indianapolis, Ind.  
Vacuum Oil Co. .... New York  
American Ball Bearing Co. .... Cleveland, O.  
J. H. Williams Co. .... Brooklyn, N. Y.  
A. W. Harris Oil Co. .... Providence, R. I.  
Hartford Suspension Co. .... Jersey City, N. J.  
Baldwin Chain & Mfg. Co. .... Worcester, Mass.  
Continental Motor Mfg. Co. .... Muskegon, Mich.  
Brown-Lipe Gear Co. .... Syracuse, N. Y.  
Spicer Mfg. Co. .... Plainfield, N. J.  
Weston-Mott Co. .... Flint, Mich.  
Pittsfield Spark Coil Co. .... Dalton, Mass.  
Firestone Tire & Rubber Co. .... Akron, O.  
Auto Parts Mfg. Co. .... Muncie, Ind.  
Pennsylvania Rubber Co. .... Jeannette, Pa.  
Remy Electric Co. .... Anderson, Ind.  
Swinehart Tire & Rubber Co. .... Akron, O.  
Gabriel Horn Mfg. Co. .... Cleveland, O.  
Consolidated Rubber Tire Co. .... New York  
Wheeler & Schebler. .... Indianapolis, Ind.  
Diamond Rubber Co. .... Akron, O.  
Westinghouse Electric & Mfg. Co. .... East Pittsburgh, Pa.  
Electric Storage & Battery Co. .... Philadelphia  
Oliver Mfg. Co. .... Chicago  
S. F. Bowser & Co. .... Ft. Wayne, Ind.  
Edmunds & Jones Mfg. Co. .... Detroit, Mich.  
Kokomo Electric Co. .... Kokomo, Ind.  
Byrne, Kingston & Co. .... Kokomo, Ind.  
Link-Belt Co. .... Philadelphia  
Stromberg Motor Devices Co. .... Chicago  
**COLISEUM ANNEX, SECOND FLOOR**  
Willard Storage Battery Co. .... Cleveland, O.  
Wolverine Lubricants Co. .... New York  
Warner Mfg. Co. .... Toledo, O.  
Muncie Gear Works. .... Muncie, Ind.  
Baldwin Steel Co. .... New York  
Esterline Co. .... Lafayette, Ind.

Texas Co. .... New York  
Gemmer Mfg. Co. .... Detroit, Mich.  
Edison Storage Battery Co. .... West Orange, N. J.  
Stewart & Clark Mfg. Co. .... Chicago  
Cotta Transmission Co. .... Rockford, Ill.  
Royal Equipment Co. .... Bridgeport, Conn.  
Briggs Magneto Co. .... Elkhart, Ind.  
Buda Co. .... Harvey, Ill.  
Waukesha Motor Co. .... Waukesha, Wis.  
United Rim Co. .... Akron, O.  
American Bronze Co. .... Berwyn, Pa.  
Findeisen & Kropf Mfg. Co. .... Chicago  
National Coll Co. .... Lansing, Mich.  
Ross Gear & Tool Co. .... Lafayette, Ind.  
Kells Mfg. Co. .... New York  
Bower Roller Bearing Co. .... Detroit, Mich.  
New Miller Carburetor Co. .... Indianapolis, Ind.  
Detroit Lubricator Co. .... Detroit, Mich.  
Ingersoll-Rand Co. .... New York  
Sheldon Axle Co. .... Wilkes-Barre, Pa.  
James L. Gibley Rubber Co. .... Philadelphia  
Garage Equipment Mfg. Co. .... Milwaukee, Wis.  
Gould Storage Battery Co. .... New York  
Ignition Starter Co. .... Detroit, Mich.  
Empire Tire Co. .... Trenton, N. J.  
A. Schrader's Son, Inc. .... New York  
Herz & Co. .... New York  
Pantastote Co. .... New York  
Cleveland Hardware Co. .... Cleveland, O.  
Homo Company of America. .... Jersey City, N. J.  
Champion Ignition Co. .... Flint, Mich.  
Stutz Auto Parts Co. .... Indianapolis, Ind.  
Note: Exhibitors in this section occupy space, with the exception of Herz & Co. and the Cleveland Hardware Co. are in both the passenger and commercial vehicle sections.

### COLISEUM ANNEX, SECOND FLOOR—PASSENGER VEHICLE WEEK ONLY

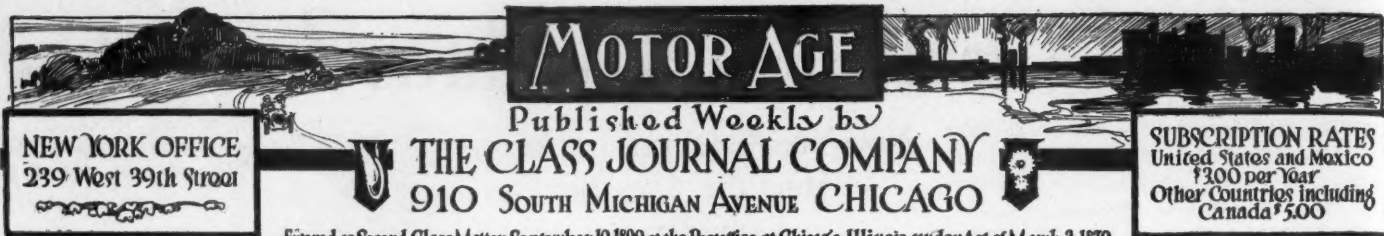
Federal Rubber Mfg. Co. .... Cudahy, Wis.  
White & Bagley Co. .... Worcester, Mass.  
Seamless Rubber Co. .... New Haven, Conn.  
Connecticut Telephone & Electric Co. .... Meriden, Conn.  
Michelin Tire Co. .... Milltown, N. J.  
McCue Co. .... Buffalo, N. Y.  
Valentine & Co. .... New York City  
Hoffecker Co. .... Boston, Mass.  
C. Cowles & Co. .... New Haven, Conn.  
Lovell-McConnell Mfg. Co. .... Newark, N. J.  
Randall-Faichney Co. .... Boston, Mass.  
G. Piel Co. .... Long Island City  
Dean Electric Co. .... Ellyria, O.  
Kellogg Mfg. Co. .... Rochester, N. Y.  
Doehler Die Casting Co. .... Brooklyn, N. Y.  
Racine Rubber Co. .... Racine, Wis.  
Sparks-Wilmington Co. .... Jackson, Mich.  
Lee Tire & Rubber Co. .... Conshohocken, Pa.  
C. A. Shaler Co. .... Waupun, Wis.  
J. H. Sager Co. .... Rochester, N. Y.  
Standard Thermometer Co. .... Boston, Mass.  
Marathon Tire & Rubber Co. .... Cuyahoga Falls, O.  
Universal Tire Protector Co. .... Angola, Ind.  
Walpole Rubber Co. .... Boston, Mass.  
New Jersey Car Spring & Rubber Co. .... Jersey City, N. J.  
Hess Spring & Axle Co. .... Carthage, O.  
Endurance Tire & Rubber Co. .... New York City  
Schoen-Jackson Co. .... Media, Pa.  
Double Fabric Tire Co. .... Auburn, Ind.  
Simms Magneto Co. .... New York  
Batavia Rubber Co. .... Batavia, N. Y.  
John L. G. Dykes Co. .... Chicago  
Vorhees Rubber Mfg. Co. .... Jersey City, N. J.  
International-Acheson Graphite Co. .... Niagara Falls, N. Y.  
Automobile Supply Mfg. Co. .... Brooklyn, N. Y.

Leather Tire Goods Co. .... Niagara Falls, N. Y.  
Adam Cook's Sons. .... New York  
Coes Wrench Co. .... Worcester, Mass.

### PASSENGER VEHICLE SECTION—FIRST REGIMENT ARMORY GALLERY

Horseless Age Co. .... New York  
Perfection Spring Co. .... Cleveland, O.  
S. Breakstone. .... Chicago  
Arminger Chemical Co. .... Chicago  
Motor. .... New York  
Mayo Mfg. Co. .... Chicago  
Tuthill Spring Co. .... Chicago  
Barco Brass & Joint Co. .... Chicago  
Peck Wheel Co. .... Chicago  
National Motor Supply Co. .... Cleveland, O.  
Automobile Journal Pub. Co. .... Pawtucket, R. I.  
Vanguard Mfg. Co. .... Joliet, Ill.  
Racine Mfg. Co. .... Racine, Wis.  
L. P. Halladay Co. .... Chicago  
Motor Car Publishing Co. .... Kansas City, Mo.  
Brown Co. .... Syracuse, N. Y.  
S. K. F. Ball Bearing Co. .... New York  
E-C Sales Co. .... Chicago  
New York Coil Co. .... Chicago  
Grip Nut Co. .... Chicago  
Rhineland Machine Works Co. .... New York  
Marburg Bros., Inc. .... New York  
Economy Equipping Co. .... Chicago  
Pittsburgh Model Engine Co. .... Peru, Ind.  
Sarco Engineering Co. .... New York  
William L. Tobey. .... Boston, Mass.  
Metal Stamping Co. .... Long Island City, N. Y.  
E. Edelmann & Co. .... Chicago  
Norma Co. of America. .... New York  
Illinois V-Ray Sales Co. .... Chicago  
Charles O. Tingley & Co. .... Rahway, N. J.  
Morrison-Ricker Mfg. Co. .... Grinnell, Ia.  
Chilton Co. .... Philadelphia  
Motor Age. .... New York  
Longdin-Brugger Co. .... Fond du Lac, Wis.  
Automatic Motor & Engineering Co. .... Chicago  
U. S. Ball Bearing Mfg. Co. .... Oak Park, Ill.  
Northway Motor & Mfg. Co. .... Detroit, Mich.  
Automobile. .... New York  
Motor Vehicle Publishing Co. .... New York  
Motor World Publishing Co. .... New York  
**COMMERCIAL VEHICLE SECTION—FIRST REGIMENT ARMORY GALLERY**

Horseless Age Co. .... New York  
Perfection Spring Co. .... Cleveland, O.  
Merchant & Evans Co. .... Philadelphia  
Federal Chain & Mfg. Co. .... Springfield, Mass.  
Motor. .... New York  
Highland Body Co. .... Elmwood Place, O.  
Tuthill Spring Co. .... Chicago  
Service Recorder Co. of Illinois. .... Chicago  
Detroit Puncture Co. .... Detroit, Mich.  
Never-Skid Mfg. Co. .... New York  
Sewell Cushion Wheel Co. .... Detroit, Mich.  
Automobile Journal Publishing Co. .... Pawtucket, R. I.  
Rhineland Machine Works Co. .... New York  
Marburg Bros., Inc. .... New York  
Economy Equipping Co. .... Chicago  
Pittsburgh Model Engine Co. .... Peru, Ind.  
Sarco Engineering Co. .... New York  
Semple S. Scott. .... Chicago  
Rich Tool Co. .... Chicago  
Harrow Spring Co. .... Milwaukee, Wis.  
Cleveland Worm & Gear Co. .... Cleveland, O.  
Norma Co. of America. .... New York  
Lavage Gear Co. .... Corliss, Wis.  
Polack Tyre & Rubber Co. .... New York  
Torbensen Gear & Axle Co. .... Newark, N. J.  
Chilton Co. .... Philadelphia  
Motor Age. .... New York  
Philadelphia Storage Battery Co. .... Philadelphia  
Automatic Motor & Engineering Co. .... Chicago  
Automobile. .... New York



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## For the Man Who Drives

**W**HEN will the Utopian car arrive, the car fitted with a satisfactory top which one man can put up or take down without crushing his fingers, or scratching the sides of the car body, the car that will not have its entire exterior with its seventeen coats of finish, defaced with spare tires, spare rims or extra wheels, and the car that can be jacked up without ruining a suit of clothes or grovelling in the dust of the road or the city street?

**S**UCH a car is needed, and worse still our makers are going quite slowly in that direction. As a matter of fact the majority of our makers are looking to the accessory man to solve many of their problems, just as today they are selling cars on the accessories they carry rather than on inherent features of superiority. The full-dinner pail of equipment has done more to dispose of the majority of low and medium-priced cars during the last season than the good points of motor design or transmission features.

**T**HE top is in grave need of refinement. Today it keeps the rain out, but it ends there. To put it up, to lower it and to put on the slip cover are jobs that call for two adults, then what hope is there for the lone female who has aspirations and ability to drive her car but who finds the top one of the most cantankerous parts of the whole outfit.

**S**OME solutions are in sight and they are not coming from the car makers, rather from the inventive accessory man. The satisfactory top must have two features: first, ability to be raised or lowered with ease by one person, and second, some ready method of protecting it when folded instead of covering it with the glove-fitting slip cover now in general vogue but so generally left off. Solutions are in sight: The slip cover may be eliminated by incorporating in the body a receptacle around the top of the tonneau into which the top can drop when folded so that nothing remains but to button a flap covering in place, and the car will not exhibit the slightest semblance of being top equipped. There

is not any reason why this cannot be carried still further—the body is quite a flexible portion of the car, and it offers sufficient latitude not only to contain the top when folded but also the spare tires or wheels.

**T**HE problem of a one-man top is also on the highway of solution, and again the accessory man is to the fore. We may look to those should-be engineers who have designed side curtains that can be opened or closed without creeping outside underneath them. The one-man top can be made much lighter than many of the present vintage, and it must permit of raising or lowering from either the right or the left side. One or two foreign makers have recently exhibited at Olympia tops which fill these requirements to a major extent, but unfortunately some of them have been too heavy, and with others the appearance has been too unorthodox to assure any ready degree of acceptance.

**T**HE demountable rim and demountable wheel are rapidly eradicating the tire nightmare, but the jack can be more or less improved. To get the jack under the rear axle of many cars is anything but an easy problem. If the road surface is soft or wet the trouble is doubled. One or two apparently satisfactory jacks were tried on the market a year ago. Mechanically they were entirely satisfactory and they largely overcame the difficulty of having to get onto the road to insert the jack and elevate it, but the makers soon discovered that the public would not accept it at the price and it was withdrawn. It would greatly facilitate matters if a score of the manufacturers would remember in designing the back axle that the car will be shod with pneumatic tires and that occasionally these tires will puncture or blow out and that when such happens a jack generally has to be used to elevate the wheel. Keeping this in mind a small boss could be formed on the housing, making a suitable anchorage for the jack. Something similar at the front axle would be equally readily fitted and would serve a great good. These little things would aid much in adding to the owner's pleasure in the use of his car.

## Smaller Motors

**N**INETEEN hundred and fourteen will witness smaller motors in many of the American cars than are used in them for next season. This trend of construction has been as the wind stirring in the tree tops for several months, in fact, years. It was 2 years ago when makers began carrying out motor refinements to secure additional power instead of adding more inches to the cylinder bore or the stroke of the piston. But the end is not yet. The average motor size for 1913 gives promise of being slightly under that of the present season, the reduction may be quite small but will prove sufficient to indicate the direction of the wind.

**E**UROPE has been working consistently for smaller motors and so continual has the pruning process been that today a motor with 4-inch bore is considered a big motor. And the makers of high-powered cars have practically dropped all of their big models, this change being particularly apparent with several of the excessively high-powered six-cylinder designs that were touted so broadly a couple of seasons ago. Today they are on the toboggan in Europe and the small-powered, high-efficiency type is taking their place.

**T**HE fact that the Indianapolis speedway for its 500-mile race next year has already announced a maximum piston displacement of 450 cubic inches, instead of 600 cubic inches, which has been the size ever since the conception of the race, is a practical acknowledgment of there not being sufficient available cars of the 600-cubic inch capacity, and in the same breath it is a further acknowledgement that smaller motored vehicles are capable of practically as great sustained speeds as the larger monsters, who wear out tires with such persistent regularity.

**T**HE piston displacement limit set by the owners of the Indianapolis speedway will without doubt be accepted by the Elgin authorities who are now discussing the use of 450 cubic inches as the maximum for the Elgin national trophy. With these two premier events running under the 450 banner it is an assured success that the small motor will receive the greatest boom in its history in America, a boom sufficient to set many of the manufacturers thinking of the folly of burning up gasoline and tires to accomplish what can be done with much greater economy through the use of smaller motors.



# French Will Run Grand Prix Anyway

PARIS, Nov. 15—After being buried, the French grand prix race has been revived, the Automobile Club of France deciding to hold the race, whatever the number of starters, and to admit entries at ordinary fees until December 31, and at double fees until March 31. The race will be held during the first fortnight in July; the place has not yet been selected.

At the present time there are seventeen entries, the firms being Sunbeam, Delage, Peugeot, Schneider, Itala, with a valveless model; Mathis, Mercedes and Opel. In an interview with a Motor Age representative, Chevalier Rene de Knyff, president of the sporting committee of the Automobile Club of France, gave it as his opinion that with the extended time for receiving entries the total number would be fifty-five or probably forty starters, thus assuring a most interesting race.

It was recognized that the original decision to close the lists at the end of October was a mistake, for a number of firms were unable to decide whether they would be able to compete at such an early date, and even those who had entered were unable to commence the construction of cars until they had received assurance that the race would really be held.

A side light on the reasons which led the club to revive the grand prix, after having obtained only sixteen out of the necessary forty entries, is given by L'Echo des Sports.

"The real reason why the Automobile Club of France has decided to preserve its grand prix is the attitude of the newspaper L'Auto," the paper says. "Once more our contemporary has earned the hearty thanks of the motor industry. Without it the grand prix certainly would have been dead and buried. It must not be supposed that this is a joke; it may be a little ironical, but that is all. We can declare today, without fear of contradiction, that L'Auto was not expecting the results it has provoked. All that it hoped for was the burial of the grand prix, although it took care not to give public expression to that hope. It would have followed the funeral procession with tears and lamentations; it would have accompanied the defunct as far as the cemetery. Then, having taken off its black coat, it would have rolled up its sleeves and given itself up heart and soul to the triumph of its own race, that race which was announced in all the majesty of big head lines and leaded matter in the issue of the paper declaring the certain abandonment of the grand prix, dead with only sixteen out of the necessary forty entries. It was a note of defiance which awoke the club to action. Without this note the club would have been content to allow its grand prix to sleep its eternal sleep. Instead, it rushed into the fray, taking a decision which has

## Entries Re-Opened and Race Will Surely Be Put On in 1913

earned for it the compliments of all lovers of sport."

The 3-liter race, to be held by L'Auto, has been fixed for Sunday, June 29, the course not yet being decided on. Present entries are Peugeot and Delage, but the list does not close until March, and it is confidently expected that between thirty and forty cars will be secured. The rules for the 3-liter race have already been in force 2 years; next season will be their last application, for Charles Faroux, who is responsible for the rules and for the organization of the race, considers that all the lessons of the 3-liter race will have been learned after the contest next June.

### CASE WINS IN EUROPE

Paris, Nov. 12—In the 1912 south Russian endurance run, held along the shores of the Black sea from Odessa to Sevastopol and return, an American Case car

driven by Penistan finished the test without a single penalty, and was awarded the first prize of the Russian Imperial Automobile Society. The field of competitors included Mercedes, Benz, Opel, Dixi, Lorraine-Dietrich, Windhoff, Adler and Fiat. This same car was awarded the prize given by the city of Moscow for the best speed trials in that city.

### HOOSIERS MAY REVISE LAW

Indianapolis, Ind., Nov. 25—It appears practically certain there will be some legislation affecting motor car interests when the Indiana legislature convenes in biennial session in January. The present motor car law was passed in 1905 and provides for a registration fee of \$1 for each car, which registration need not be renewed. It also stipulates a speed of 8 miles an hour in business districts and 15 miles an hour in residence districts of cities and towns and of 20 miles an hour in the country.

Senator J. J. Netteville, of Anderson, already has prepared a bill providing annual license fees for motor cars, new speed regulations, and that the money collected from the licenses shall be distributed among the different counties for road building and repair purposes. It is estimated the license scheme would net from \$250,000 to \$300,000 a year.

An annual license fee of \$10 for motor car manufacturers is proposed, as well as a fee of \$5 a year for the first 2 years and \$3 for each succeeding year for chauffeurs. For motor cars the licenses would be \$5 for cars up to 25 horsepower; \$10 for cars from 25 horsepower to 35 horsepower; \$15 for cars from 35 horsepower to 50 horsepower, and \$25 for cars above 50 horsepower.

The new speed regulations proposed for cities and towns is 10 miles an hour in business districts, 12 miles an hour in residence districts, 15 miles an hour in outlying districts and 25 miles an hour in the country.

### DETROIT S. A. E. MEETS

Detroit, Mich., Nov. 25—The first real get-together meeting of the Detroit section of the Society of Automobile Engineers was staged at the Detroit Motor Boat Club house on Thursday evening, November 21. An informal dinner was served and there were 125 on hand to enjoy the repast. This is the largest gathering which has ever turned out for an affair of any nature given by the Detroit section. No engineering subjects were discussed, the object being to afford the members an opportunity to become better acquainted with one another. By offering social advantages to its members in addition to merely technical ones, it is hoped to gather attract members of the national body.

## Coming Motor Events

November 28-29—Track meet, Richmond Automobile Club, Richmond, Va.  
December 2-3—Annual meeting American Automobile Association, Chicago.

### SHOWS

November 26-30—Show at Grand Rapids, Mich.  
December 7-22—Paris salon.  
December 16-21—Show at Seattle, Wash.  
January 2-10—Importers' Salon, Hotel Astor, New York.  
January 4-11—Cleveland.  
January 4-11—Montreal.  
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.  
January 11-22—Brussels, Belgium.  
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.  
January 20-25—Philadelphia.  
January 20-25—Milwaukee, Wis.  
January 21-26—Toledo Show.  
January 22-25—Geneva, N. Y.  
January 25-February 1—St. Johns, N. B.  
January 25-February 1—Show at Providence, R. I.  
January 25-February 1—Montreal, Canada.  
January 27-February 1—Scranton, Pa.  
January 27-February 1—Detroit.  
January 27-February 1—Pleasure Show, Buffalo, N. Y.  
January 30-February 1—Canandaigua, N. Y.  
February 1-8—Chicago.  
February 10-15—Chicago truck show.  
February 10-15—Minneapolis.  
February 11-15—Ottawa, N. Y.  
February 15-22—Newark, N. J.  
February 15-22—Albany, N. Y.  
February 16-23—Richmond, Va.  
February 17-22—Kansas City.  
February 24-March 1—St. Louis, Mo.  
February 24-March 1—Memphis, Tenn.  
February 24-March 1—Cincinnati, O.  
February 24-March 1—Omaha, Neb.  
February 24-March 1—New Orleans, La.  
February 26-March 1—Fort Dodge, Ia.  
March 3-8—Pittsburgh.  
March 8-15—Boston pleasure car show.  
March 18-22—Truck show, Buffalo, N. Y.  
March 19-26—Boston truck show.  
March 24-29—Indianapolis.

# Conveniences Noted on Olympia Bodies

**Tendency Seems to Be Towards Stream-line Effects, with Bonnet Merging Gracefully with Body Proper—Designing Weak in Providing for Luggage-Carrying Space**

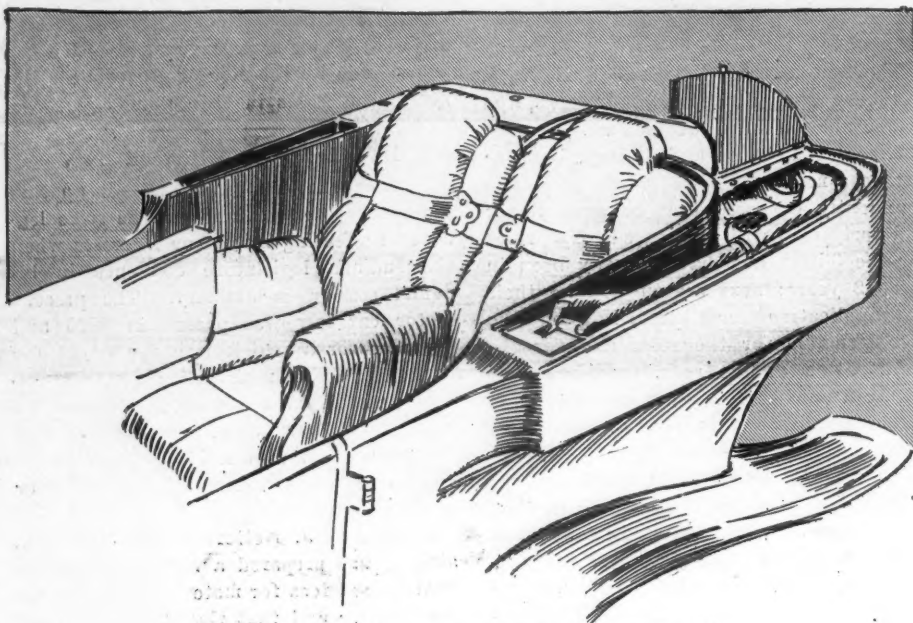


FIG. 1—N. A. G. CASE FOR CARRYING TOP WHEN DOWN

**L**ONDON, Nov. 16—Bodywork at the Olympia show is in a well-developed and very satisfactory section. A number of the most important car manufacturing firms, having made only minor changes on their chassis, are showing nothing but complete cars, although they do not specialize on standard and completely equipped cars. Such firms, for instance, as Rolls-Royce, Daimler, Delaunay-Belleville, Hotchkiss and Singer do no business in completely equipped stock models, yet it is such firms as these that are showing nothing but complete cars.

Every convenience for motoring appears to have been well thought out and to have been well provided for, with the exception of the provision for carrying luggage. It might be imagined that the Englishman, when touring by motor, carries nothing more bulky than a pocket comb, for there are not more than three or four cars in the show in which provision has been made even for a small grip. The storage of accessories for the car is adequate, but accessories for the occupants of the car have no place in the general scheme. Either the British motorist never travels long distances or he makes use of the railroad for the carriage of baggage.

## European Color Schemes

Color schemes are on the sober side. Dark greens with black and white lining and silver plated fittings are seen everywhere. Various shades of gray, with either silver plated or gun-metal fittings, are another strong combination. Buff color is fairly common for racy touring cars; reds

## By W. F. Bradley

are absent except in the darker tones, and even these are not numerous. The whole tendency is towards sobriety in the color combinations.

### Clever Idea on N. A. G.

There is a remarkably strong tendency towards stream-line bodies. The break at the rear of the bonnet has been abolished on practically all types of cars. In other words, there is no dashboard, the bonnet of the car merging as gracefully as possible into the body of the car and into the scuttle dash. This is the general feature on touring cars, where, more often than not, the gasoline tank forms the dash, but it also is to be found on limousines, landaulets and other types of closed cars. In some of these cases it has been a difficult matter to make a comparatively short bonnet merge gracefully into a low scuttle and both designers and metal workers have had a difficult task. In the attempt to produce graceful stream-line bodies for touring cars the tendency has been to somewhat restrict the passenger-carrying space. The maximum width of the body is only slightly greater than the width

of the chassis, the base of the body being flush with the side frames, and the sides flaring out only slightly. Obviously this decreases the width of the rear seat.

### Stream-Line Bodies Popular

A very fine example of this type of stream-line touring car body is shown on a N. A. G. chassis, the body being by Kellner. There is an unbroken line from the radiator to the top of the scuttle dash, no projections whatever, and the rear is bluntly canoe-type, without any overhang. The top has been included in the stream-line scheme, for when it is down it fits within a box, as shown in the drawing, Fig. 1, the edges of the box very gracefully tapering into the sides of the body. The two front seats are separate, and the rear seats also have a slight division. A short scuttle is built from the top of the back of the front seats.

Two spare seats are fitted in the back of the front seats, and when these are pulled out leg room is given under the front seats. The rear seats are on rails, allowing them to be pulled out so as to give practically 6 inches more than normal depth. Very wide running boards are fitted, with tool boxes under them, the board being hinged to give access to the boxes, and the outer side of the box sloping inwards, so that its presence is not visible except when viewing the car from long range. Electric lights are fitted throughout, lamps being let into the top of the front mudguard and given a trailing tail in order to avoid an abrupt break. The color scheme is gray. From a fast touring standpoint the car is ideal; the only charge that can be brought against it is that there is no place for baggage except on the top of the running boards.

### Lorraine-Dietrich Touring Car

Not quite so elaborate, but similar in general lines, is a Lorraine-Dietrich touring car with bonnet merging into a scuttle dash brought up fairly high, thus making

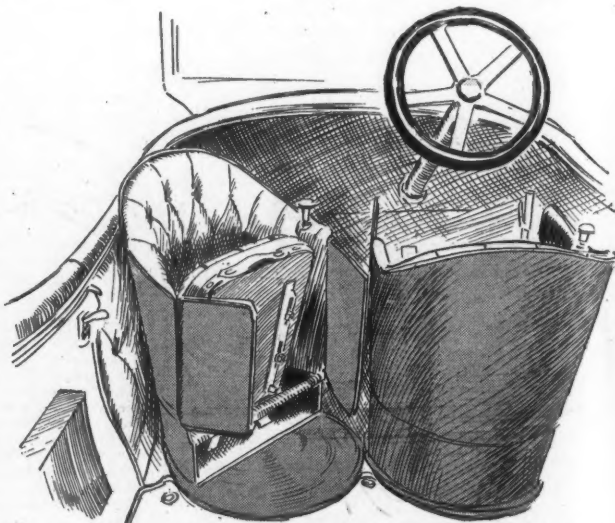


FIG. 2—FOLDING CHAIR ON CHENARD-WALCKER



# Sober Colors Preferred by Europeans

it necessary to fit only a low windscreen. As the chassis is a 40-horsepower model, there is sufficient length of bonnet to make the sweep into the dash without any apparent effort. A feature is the ready detachability of the mudguards, secured all round by winged nuts. Tool boxes are under the running boards, with the outer edge of the box cut away to render it invisible. The color scheme is a silvery gray.

On a light Chenard-Walcker chassis is shown a very fine example of a torpedo boat body, providing four seats only, the two rear ones being fixed and full width and the front ones being independent arm chairs. The two chairs fold up and can be swung round to face rearwards, Figs. 2 and 6. There is only one entrance on each side, just behind the front seats, the driver reaching his place by collapsing the seat to the left. The feature of the body is the perfect boat shape obtained.

In accordance with the standard Chenard-Walcker practice, the bonnet is sloped up to the gasoline tank, there being no dash, and from the dash the body line has a very graceful slope up to the rear. The general idea will be better understood by reference to the sketch than from a written description. With only one door on each side a very convenient entrance can be obtained. A single piece panel is employed from front door post to front door post, with louvres for the admission of air beaten out of the metal—this is a remarkably fine piece of work. On the inner panel of each door is an emergency seat, invisible when not in use. The two front seats are carried on a central pivot and can be regulated for height and inclination.

## Features of La Buire

La Buire shows a less costly but hardly less interesting type of touring body with a rounded top dashboard gasoline tank flush with the end of the bonnet and the

**Dark Greens with Black and White Lining and Silver-Plated Fittings Seem to Be Most Popular—Gray Also Has Big Following—Buff Fairly Common on Racy Cars**

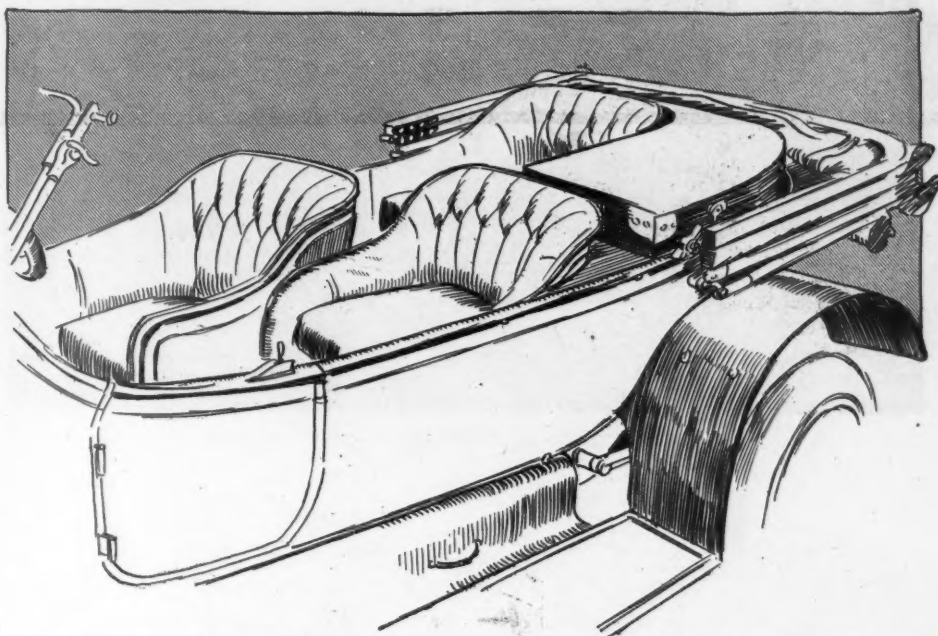


FIG. 4—GREGOIRE THREE-SEATER WITH BAGGAGE SPACE IN TONNEAU

scuttle. The feature here is a scuttle hinged to the top back of the rear seats, thus forming a partial covering over the tonneau. The top of each door is swept in to join this hinged scuttle, the result being that with the exception of the windscreen the rear passengers have the same protection as those in the front seats.

The arrangement doubtless will prevent swirling eddies around the feet of the rear passengers. As the lid can be hinged up it does not interfere with the use of emergency seats, and the arrangement undoubtedly improves the lines of the car. The same type of rear scuttle is to be found on other stream-line bodies, but it is generally fixed and is intended more to give a racy touch to the lines than to add to the comfort of the passengers.

Probably because of their wet, muggy climate, British makers have given a lot of attention to the mudguarding of their cars. Mudguards which do not guard are practically unknown at this show. The most popular type at Olympia is the domed guard brought well round the front of the steer-

ing wheels and often given a trail at the tail end of the rear guard. There is a tendency for this type of guard to give a heavy appearance to the car, but its effectiveness in keeping down mud cannot be doubted.

The center of the guard always is brought well over the center of the wheel, and with a considerable total width, there is not a little overhang; this entails a very wide running board to harmonize with the mudguards. There are cases of running boards 18 inches in width. The domed mudguard frequently has its edges tumbled in. This often makes a bad break between the mudguards and the running boards, especially when the tumble-in of the guards is exaggerated.

To avoid this break, one of the Masui bodies was fitted with a whaleback type of running board. In other words, the outer edge of the board, instead of being vertical, was semi-circular, the curve harmonizing with that of the mudguard. Obviously, for such a design, an all-metal construction was adopted, and on the top of each running board are two rails, with a tray carrying a fiber mat set on them before each door.

## Some of Masui Ideas

Metal cheeks between mudguards and frame members always are fitted, but when the domed guards are carried far forward there is apt to be little space left for the fitting of headlights. On the Masui body, and also on one or two others, the cheeks to the front guards were so shaped that

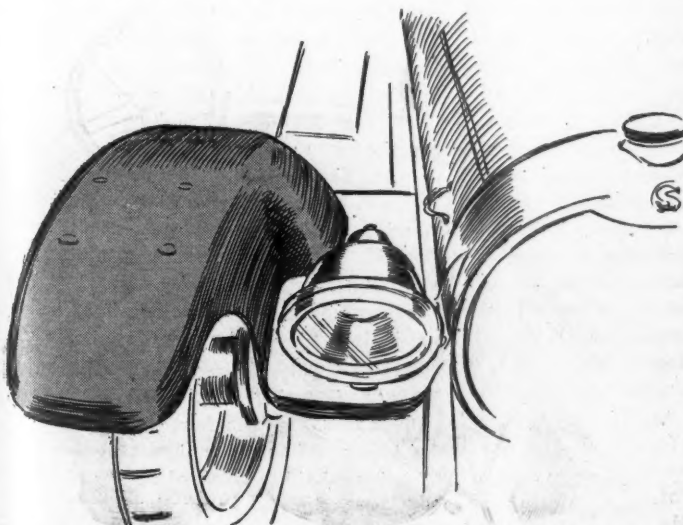


FIG. 3—NEW PLACE FOR HEADLIGHTS ON MASUI BODY



INTERIOR VIEW OF GREGOIRE TRIPLE BERLINE

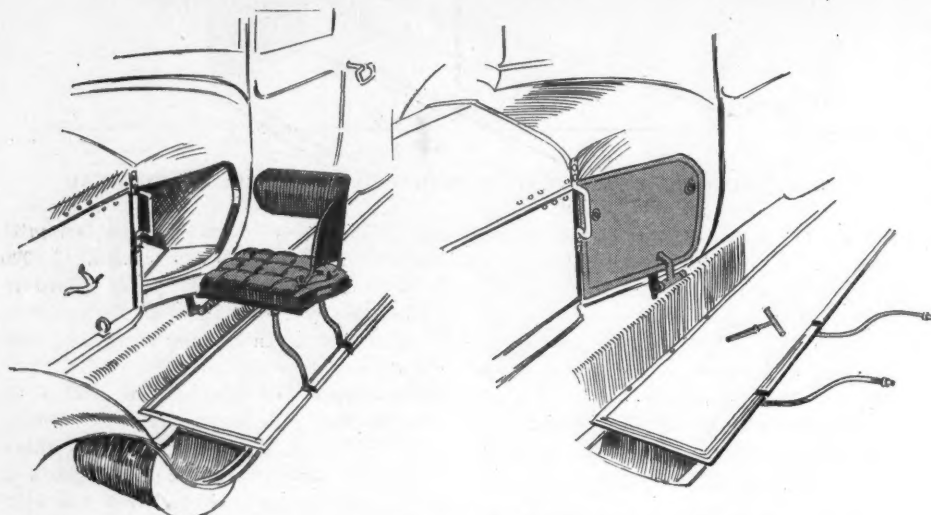


FIG. 5—DISAPPEARING CHAUFFEUR'S SEAT ON VAUXHALL

the front portion set very close to the wheel, leaving room to insert the headlight, or the rear portion of the headlight, between the side of the radiator and the cheek. The general arrangement is shown in Fig. 3. The design is decidedly neat; it also gives a little more protection to the lamps and does not interfere with the diffusion of the light.

#### Invisible Tool Boxes

The fitting of invisible V-sided tool boxes under the running boards already has been mentioned as a strong feature on the present season's cars. There also is a tendency to make provision within the chassis for the carrying of batteries and spares not often required. On the Lancia this is made a feature of the chassis equipment and is not left to the body builder. The box is set in on one side of the propeller shaft, being hung from two transverse bars, and is of sufficient capacity to receive the electric light batteries, spare lubricating oil, a spare can of gasoline and various tools.

This firm has standardized the complete equipment of the chassis with the exception of the body. The chassis has its tank in position, its tool box just mentioned, electric lighting dynamo connected up and all wiring fitted, Klaxon and reed horn in position, speedometer fitted, brackets mounted for receiving mudguards, and lamps in place. The equipment also included spare tire and rim and the car has wire wheels with demountable rims. This limits the task of the bodymaker to fitting the body only. As it is supplied, there is everything on the chassis for a long journey with the exception of a seat. It is believed that this policy will please clients buying high-grade chassis, for they have no extras and are given full liberty in the display of individual taste regarding the body.

#### Closed Cars Popular

Closed cars appear to be decidedly popular with English motorists; certainly at the show they are more numerous than fully open touring models. Doctors' run-

abouts, often designated cabriolets, are commonly seen. They are two-seaters with an emergency seat in the rear, the main portion of the body being either fully open or fully closed, as desired. On one of these, built by Morgan, a big panel was hinged in the scuttle dash, thus making it possible to give any degree of opening required for the admission of air. Beneath the scuttle dash is a big shelf for carrying parcels, and in each corner cupboards for accessories.

On another model of this type of two-seater, the rear portion of the body formed a platform for luggage, but could be opened to give an additional seat. The top is in two parts, the rear portion merely hinged up to form a back; the forward portion hinged over completely, its top, rubber-covered surface, turning down on a box within the rear of the body, and the padded surface, then coming uppermost, serving as a seat. This arrangement makes the whole of the rear portion available for luggage-carrying when required.

#### Development of All-Weather Bodies

All-weather bodies have been given a lot of attention. They are a development of the touring car with more protection than can be obtained from top and side curtains. The framework to receive the windows at the back of the front seats is made collapsible, and the windows let down into pockets. Generally the canvas top gives protection as far forward as the rearmost door post. This is a type of body particularly suitable for English weather conditions.

Saloon or berline cars are one of the most outstanding features of the body section of the show, and as they are cars really built for use and not intended to serve merely as show attractions, they are a most valuable collection. The most original body in this class is undoubtedly the triple berline built by Alin & Liautard on a Gregoire chassis, illustrated last week.

It is built on the lines of the old English coach, and is really three coupes combined in one, the roof having three distinct curves, with a special all-leather straight line traveling trunk mounted on the top. At the rear is a leather traveling trunk profiled to fit the back panel and having on each side of it a couple of old-fashioned dummy spring hangers, as used on the old stage coaches, and serving to enforce the illusion. There are two doors on each side, the forward one giving admission to the driver's seat, and the rear one to the rear compartment having two swinging arm chairs and a full width seat at the back. Gray broadcloth and flowered design silk are employed for the interior upholstery.

#### Luggage-Carrying Overlooked

This is one of the few cars at the show having provision for luggage carrying. This is probably explained by the fact that it is a continental production—continental motorists do not rely on the railroad. The mudguarding might have been improved



and more attention paid to the matter of carrying tools and mechanical spares. As a bodymaker's job it is unique, the cabinet facing the two front seats in the main portion of the body being in itself a work of art. The total height of the body has been kept low, without giving a squat appearance, the designer having in view the fact that the car is intended for long distance touring, on which class of work wind resistance must be considered. The motor, too, has only four cylinders of 80 by 160 mm. bore and stroke.

Plainer, but hardly less original, is the Mulliner body built on a six-cylinder Vauxhall chassis. It is a straight-line type with a V-shaped glass front, the bonnet merging into the scuttle dash without any break, and a slight increase in height given to the roof just over the central portion of the body. This relieves the monotony of the straight line, and also gives a little more height for entering the car, there being but one door on each side. The seating accommodation comprises two swinging arm chairs and a full width seat at the rear. Provision for the chauffeur has been made outside the body, Fig. 5.

#### Seat in Scuttle Dash

There is a hinged panel near the base of the scuttle dash, which, on being opened down, forms a fairly comfortable seat. Legs, normally carried under the foot-board, receive it, and the occupant of the seat is given a more secure position by a big well set into the mudguard. A really comfortable seat in this position is only possible with a very wide running board. Nothing is lacking in this respect, as the board measures 18 inches across. The color scheme of the car is silver gray with silver plated fittings and green upholstery inside.

Another important car in this section is the Cunard company's saloon on a six-cylinder Napier. This has stream-line forms, the bonnet merging into the dash without a break, the glass front being V-shaped, the roof domed, and the rear rounded off. There are two entrances on each side, but the front seats are so deep that they have to be hinged up to give admittance. The interior lining, including the roof, is of satin wood, and owing to the dome of the roof and the rounding off of the rear corners, this has entailed some very delicate work.

A good feature is the method of securing the frameless windows without any straps. There is a little knob on the top of the window for ease in lifting it. The glass is secured in any position by means of a rubber-faced wedge mounted on the inside edge of the floor frame and pressing against the glass through the operation of an eccentric. The glass is carried between velvet-faced grooves and is prevented from breakage when dropped fully down by a coil spring in the bottom of the frame. An alternative method of raising a frameless window without any visible mechanism is by means of an internal spring operated



INTERIOR VIEW OF GREGOIRE TRIPLE BERLINE

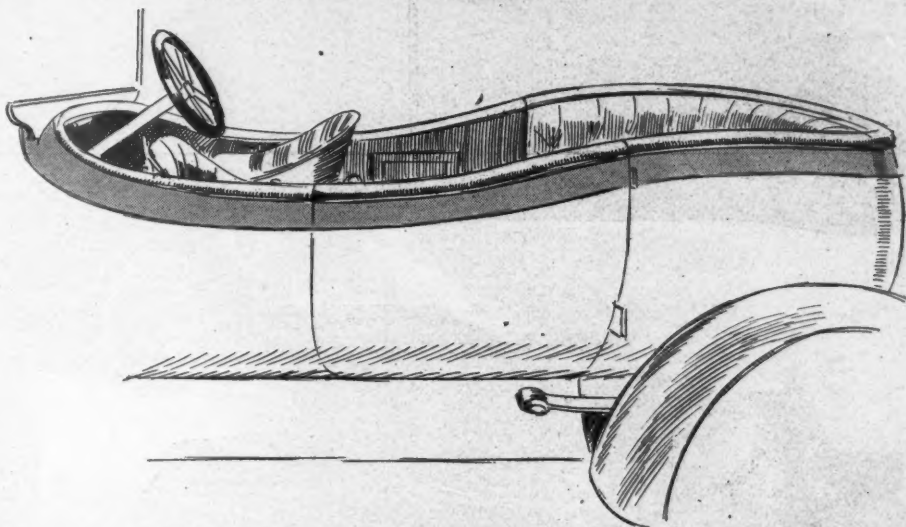


FIG. 6—CHENARD-WALCKER SHOWING REVOLVING SEATS

by a knob to be turned clockwise to lift up, and in the contrary direction for lowering.

#### Sliding Roof Fitted

On a handsome limousine by Thrupp & Moberly the roof has been made sliding, so that when fully back the half of the rear portion is open to the air. The arrangement of the windows behind the driver's seat is interesting. The central panel being oval, with an upright oblong panel to left and right of it. The same scheme has been carried out for the rear of the body.

Apart from these models, which are of the highest and most expensive class, there are a number of medium-class saloon cars of the stream-line type in practically every case. There is no break at the dash, the roof is domed, the front windscreen either is V-shaped or has its angles rounded off, and the rear corners of the car are well rounded off.

European method of construction is nearly always a combination of wood and metal. Sheet aluminum is less used than

sheet steel, owing to the higher cost of the former. On the cheaper grades of cars the construction is a wood framework and sheet steel panelling. On the more costly models aluminum is made use of, but it is not so frequently met with as on American cars.

#### FAST TIME BY SMALL CAR

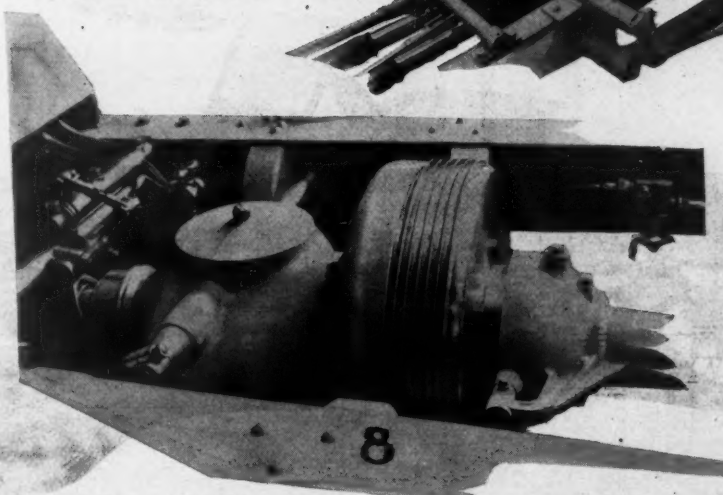
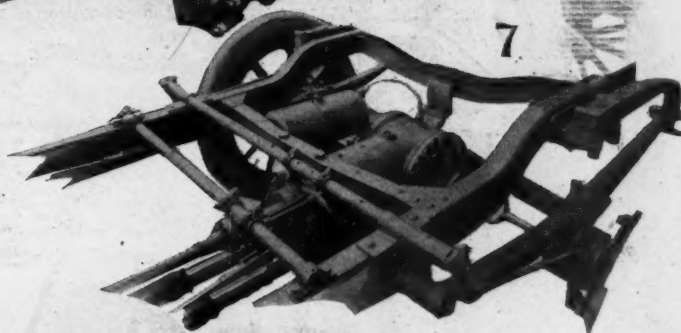
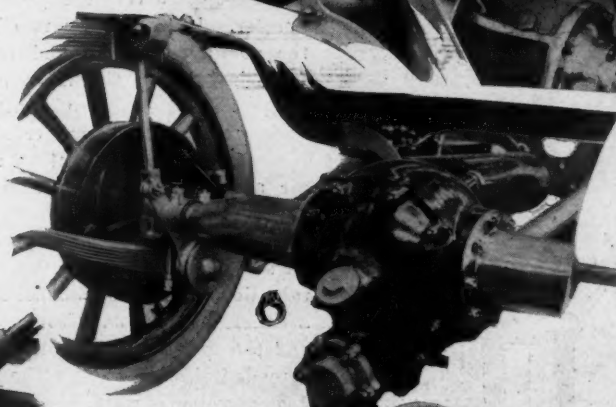
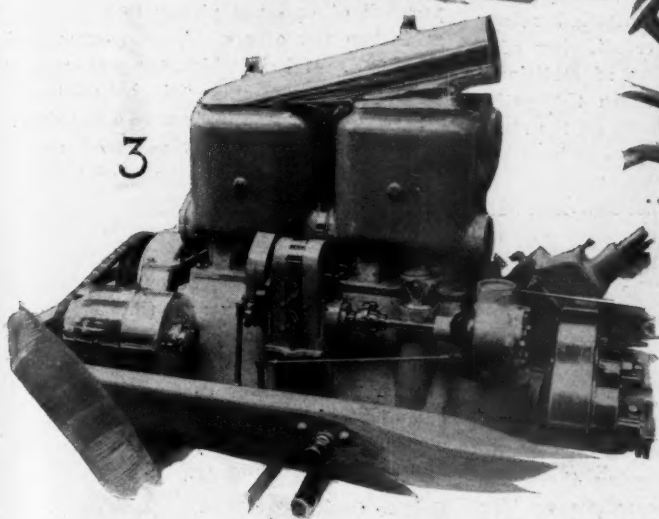
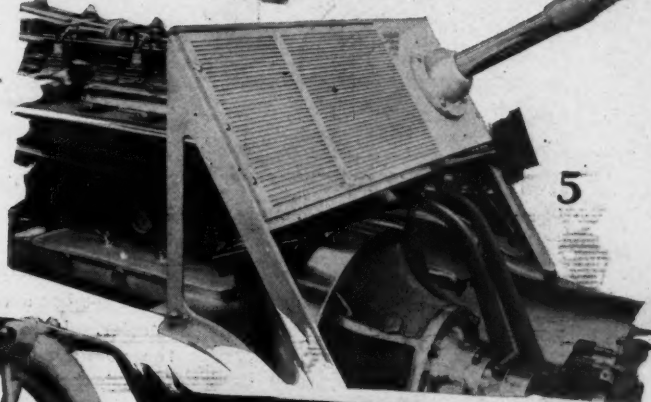
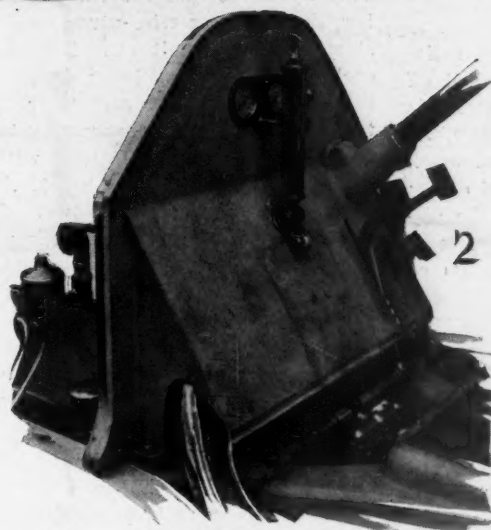
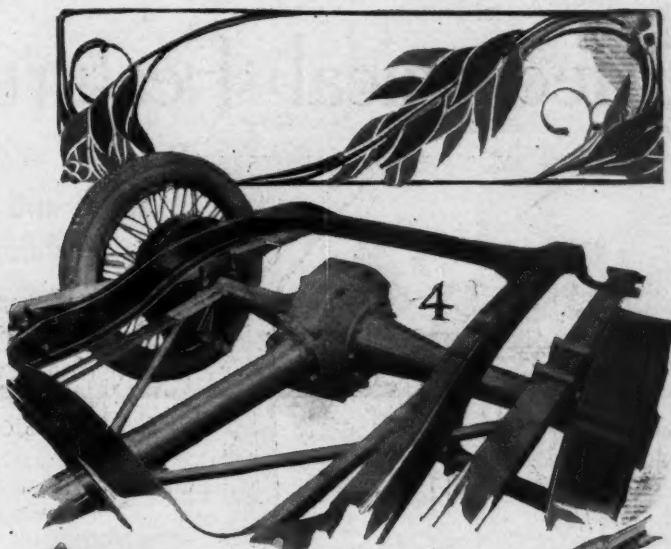
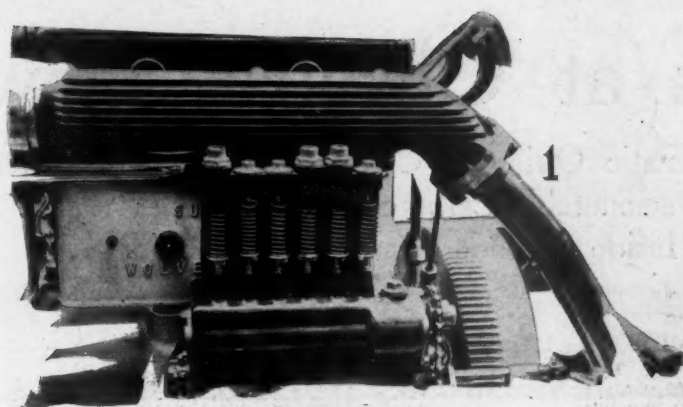
London, Nov. 9—A 11.9-horsepower Arrol-Johnston, with a bore of 2.72 inches and a stroke of 4.72 inches, has succeeded in breaking its 6-hour class record on the Brooklands track, traveling 368 miles 742 yards in that time, as against the old mark of 303 miles 282 yards. The distance by hours was:

Hour	Distance		Old record	
	Miles	Yards	Miles	Yards
1.....	61	63	50	1268
2.....	122	1054	93	234
3.....	182	1011	143	1654
4.....	245	343	192	876
5.....	305	1146	247	1664
6.....	368	742	303	282

In addition the Arrol-Johnston did 50 miles in 49:14.95, 100 miles in 1:38:01.75, 150 miles in 2:28:34.49, 200 miles in 3:16:42.89, 300 miles in 4:54:36.46.







# SOME OLYMPIA FEATURES

- 1—Air motor self-starter on the Sunbeam
- 2—Aluminum dash on the Nazzaro
- 3—Dynamo on the Arrol-Johnston
- 4—Panhard's rear axle construction
- 5—Aluminum dash on the Sheffield-Simplex
- 6—Rear axle used by Peugeot
- 7—Lentz transmission as used on the Charron
- 8—Sava gearbox with big brake drum

# Mechanical Features at Olympia Show

## Berliet's Automatic Oiling of Clutch, Gearbox and Differential and Demountable Carbureter—Spa Carries Water-Pump Inside Cylinder Casting—Other Ideas

**L**ONDON, Nov. 16—In addition to forced feed lubrication of the motor, through a hollow crankshaft, Berliet has this year made provision for the automatic oiling of the clutch, gearbox and universal joint, as noted at the Olympia show.

The pipe brought up to the pressure indicator on the dashboard is branched off to three adjustable drips on the motor side of the dashboard, Fig. 1, the three pipes going respectively to the front universal, to the gearbox and to the fore end of the torque tube, and through this to the differential housing. To indicate the level of oil in the base chamber, the stem of the float, fitted with a pointer, is brought through the dashboard, indicating the amount of oil available. The arrangement is very simple, as well as most useful.

### Berliet Demountable Carbureter

Berliet has a very easily dismantled carbureter. It is held by two bolts only to the combined intake and exhaust manifold, just below the main mixing chamber. There is a hand-controlled rotary valve within this chamber allowing of a regulating of the quantity of additional air admitted. To take down the entire carbureter, only the two nuts on the studs from the mixing chamber have to be taken off and the gasoline line disconnected. To take down the float chamber and jets, only a couple of nuts have to be slackened off and the swinging bolts on which they are threaded thrown back. The cover of the float chamber is merely held down by a flat blade spring. The general arrangement is shown in Fig. 2.

Scat has a somewhat similar and equally simple method of disassembling the carbureter, Fig. 3. The main body is held by two bolts only. On releasing these the whole of the carbureter comes away. The lower portion, comprising jets and float chamber, is attached to the intake pipe

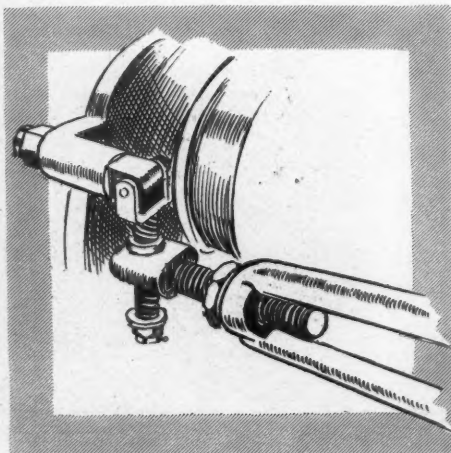
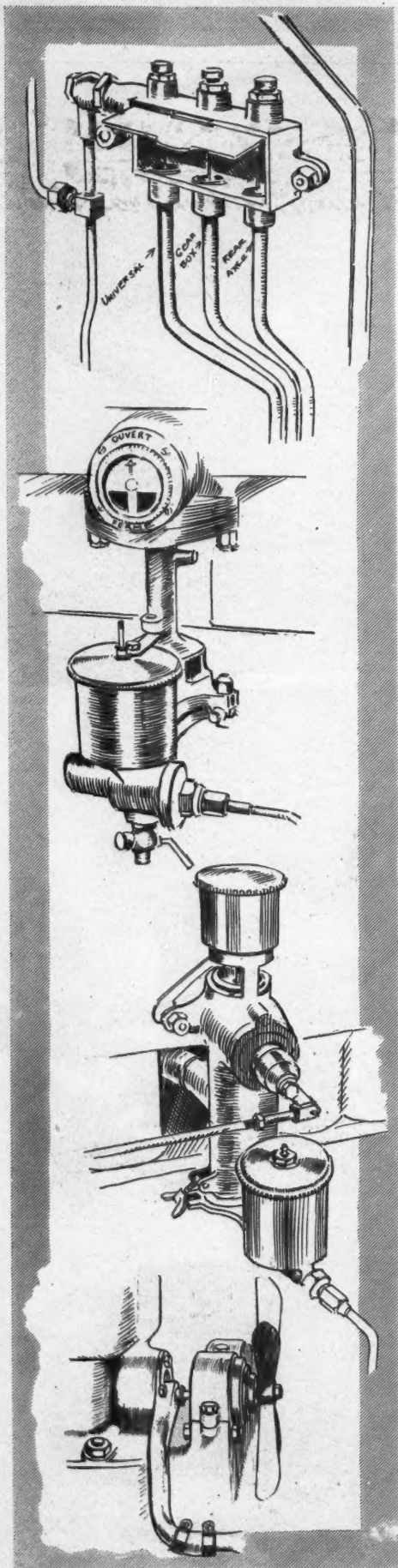
merely by a couple of swinging bolts and winged nuts. The vertical intake pipe has connected up to it a horizontal pipe passing between the base of the second and third cylinders into the valve-stem chamber, there being a wire gauze plate on the stem cover to admit air. This tends to cool the valve stem and also slightly warms the air taken into the carbureter. At the top of the tube is a supplementary air dashpot which can be entirely withdrawn by being unscrewed. The top of the float chamber is only screwed down. On this motor there is a universal coupling for the magneto. A number of steel plates have slots punched in them and are placed together so that the slots coincide. The flanged boss on the driving shaft is bolted to the center of the group of plates, and the outer edge of the group is bolted to a cup-shaped flange on the magneto shaft. The slots in the plate which form the coupling provide for universal movement.

Italian designers have carried the suppression of external piping to a finer degree than any others. A good example is the Spa, Fig. 4, in which the water pump is inside the front end of the cylinder casting, the driving spindle having a four-blade aluminum fan which is mounted on its outer end. The intake pipe is cast within the crankchamber and leads up to the mixing chamber in the base of the cylinders. The float chamber is merely held by two bolts and nuts before the opening in the crankchamber and the throttle is in the cylinder casting itself. A somewhat similar design is found on other Italian motors. The casting is obviously complicated, but the advantage to the car owner is a very simplified clean-cut motor and ease of dismantling.

### Belsize Carbureter Idea

To make the jet more get-at-able, Belsize has screwed it into the body of the carbureter and fitted it with a winged head, thus avoiding the use of tools for dismantling. The cover of the sliding sleeve for the throttle also is held on by a winged nut. A rather uncommon adjustment on this car is that provided for the triangular torque stay as shown in one of the sketches, Fig. 5.

Vauxhall has paid a lot of attention to lubrication details on the new 90 by 140



Reading from top to bottom:  
Fig. 1—Berliet, automatic oiling of gearbox, clutch and universal joint  
Fig. 2—Berliet demountable carbureter  
Fig. 3—Scat demountable carbureter  
Fig. 4—Water pump inside Spa cylinder casting  
Fig. 5—Belsize adjustable torque member



# That Appeal to Motor Car Engineers

## Crossley Fits Gearbox Breather to Prevent Leakage of Oil— Panhard Offers Some New Ideas in Small Car—Daimler Produces Two New Models with Novel Features

millimeter model. The plunger type oil pump and the air pump, Fig. 6, are worked from an eccentric off the camshaft end, the air plunger being above and the oil plunger below. There is a double tell-tale, one being a pressure indicator and the other a plunger, both on the dashboard. When the plunger is raised a certain quantity of oil is carried forward by a separate lead to the chain driven timing gears.

### Sliding Filter Tray

The sliding filter tray, Fig. 7, pulling out at the front of the motor, is a very good feature. The carburetor is mounted on the opposite side to the valves, but all the air is drawn through three longitudinal slots above one of the valve stem covers into the valve-stem chamber, and from there through a pipe between second and third cylinders to the carburetor. This warms the air and prevents hissing.

There is a vernier adjustment for the camshaft pinion giving a very fine setting for the timing and correcting any errors which may develop by reason of adjustments of the chain. By this means, whatever wear may develop in the chain and in the pinions, the motor can be kept as new so far as the timing is concerned. The propeller mounted on the end of the fan spindle within the waterjacket, and intended to aid the natural flow, is another very good feature.

Car owners frequently complain of the leakage of oil from the gearbox. This is often due to the fact that the pressure in the box rises above atmosphere. Recognizing this, Crossley now fits a gearbox breather, Fig. 8, the top hinged to allow it to be used as a filler when necessary.

There are several departures from their usual practice in the small four-cylinder Panhard of 70 by 140 millimeters. One cap is used for a pair of valves, and instead of the plugs being mounted in the valve caps they are placed in the center of the combustion chamber. Valves are all on one side, but there are no external valve tappet guides. The tappets are long and have cup-shaped heads receiving the valve stems. They pass through a hole in the top of the crankchamber, there being a considerable amount of play here. This portion of the top of the crankchamber is hollowed out, with a slight wall around it, forming a chamber in which oil will

collect and drip back again from one tappet hole to the other. Right in the center of the line of valves is a breather forming a part of the casting. The valve stems are carried under a cover. As on the smaller Knight models, there is unit construction of motor and gearbox with three-point suspension. There is a rubber buffer mounted on the front end of the propeller shaft, just below the transverse frame member back of the gearbox.

Daimler has this year produced two new models, a four and a six, each one having a bore and stroke of 4 by 5½ inches. Both models have their cylinders offset, the amount being 13 millimeters. Pump and magneto shafts are now placed parallel with the crankshaft so as to dispense with spiral gearing and reduce overall length. The old sight-feed on the dashboard has been abolished in favor of a plunger gauge alongside the filler cap at the rear of the crankcase. By this the driver can test the working of the pump when replenishing the oil supply.

### Daimler Refinements

The opening of the filler cap automatically opens the oil level tap in the base chamber, allowing surplus oil to run straight away. An electric lighting dynamo is now a standard equipment, the drive being taken by a belt from a pulley on the front end of the crankshaft. The semi-elliptic springs are now underslung, this change bringing the chassis rather nearer the ground. A complete worm wheel is now fitted in the steering gear, in place of a quadrant, in order to allow for taking up wear.

On the new Bianchi models the crankchamber has been carried right up to the overhanging valve chamber and water jacket, all the valve mechanism being included in the aluminum shield forming part of the crankchamber.

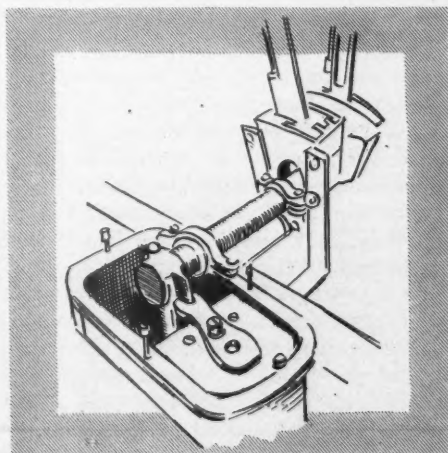
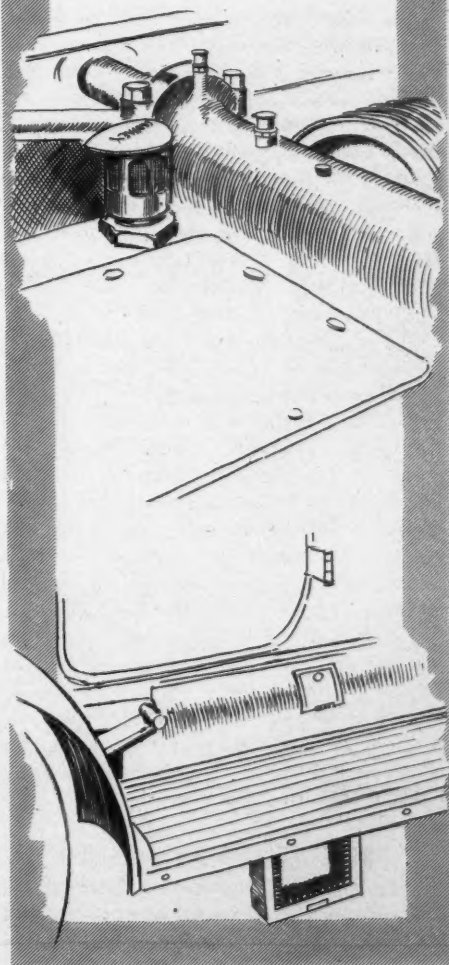
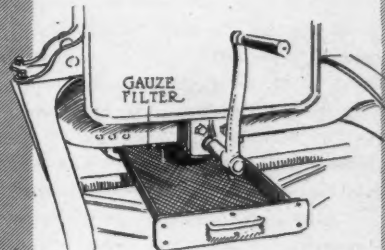
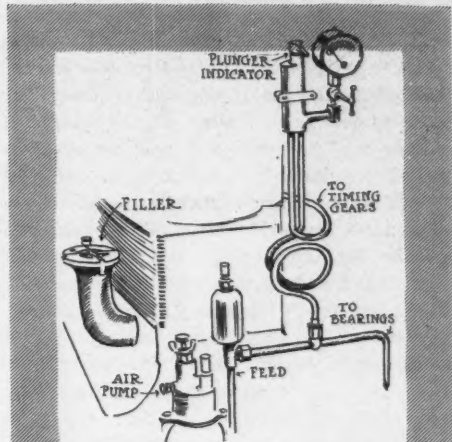


Fig. 6—Vauxhall oiling system

Fig. 7—Sliding tray filter on Vauxhall

Fig. 8—Crossley gearbox breather

Fig. 9—Boot brushes below running board

Fig. 10—Vauxhall change-speed mechanism, flat plate covering plungers of gears when not in engagement

# Flanders Manager of United Motors Co.

NEW YORK, Nov. 26—Announcement made this afternoon by Roberts Walker and W. E. Strong, receivers for the United States Motor Co., makes public the appointment of Walter E. Flanders as manager of the company and its five factory subsidiaries for the receivers and W. F. McGuire as assistant manager. They will have authority over all departments of the company except the auditing, accounting and treasury, which will be operated for the present by the incumbent forces.

Affairs of the United States Motor Co., now in receivership, are working out about as expected. There has been some delay in getting started on the manufacturing schedule of the Maxwell plants, but the receivers have just announced that the preliminary work has been concluded and that the flotation of the \$1,500,000 of receivers' certificates will be undertaken shortly. It was found that another inspection of the plants had to be made and this served to delay proceedings.

Practically 96 per cent of the claims against the company has been filed with the designated depositary and the time for depositing stocks has been extended until December 9, when it is expected that about 60 per cent will have been impounded.

The course of the procedure has not all been smooth, however. Suit has been entered against the company in the New Jersey branch of the United States district court on behalf of three creditors whose claims aggregate about \$5,000. The grounds for the action apparently are that the New York suit is invalid because the complainant company, the Brown & Sharpe Mfg. Co., is a Rhode Island corporation and the United States Motor Co. has its legal existence in New Jersey.

The apparent theory of the complainants in this case is based upon the same assumption as was the demurrer to the court's jurisdiction, which was informally filed in the New York suit. Judge Hough disposed of the claim by stating from the bench that in his opinion he did have jurisdiction. Whether or not there is any element of contempt of court in the New Jersey suit is a question that has stirred up considerable interest in New York.

Joline, Larkin & Rathbone, attorneys for the creditors of the company, are of the opinion that there will be no serious consequences as the result of the new suit. A serious consequence in the matter would be a delay in the scheduled sale and reorganization of the company.

## RECEIVER FOR POSS NAMED

Detroit, Mich., Nov. 26—Affairs of the Poss Motor Co. were brought to a head last week with the filing of a petition in the United States district court before

## Receivers Appoint Head Over Concern and Subsidiaries —McGuire Assistant

Judge Tuttle by the Detroit Foundry Co. and several other creditors, to have the Poss concern adjudicated a bankrupt. E. H. Rogers was appointed receiver, and the case referred to Lee E. Joslyn, referee. It is claimed by the petitioners that the Poss company is insolvent and that the plant has not been in operation for the past 3 or 4 months. It is further claimed that a number of judgments have been filed against the concern.

The Poss Motor Co. will contest the granting of the petition when it comes up in court again within 2 weeks, on the ground that with the help of the major creditors' committee which is now engaged with its affairs, it can be set on its feet. Reorganization plans are at present under way. It is stated that \$150,000 new capital is needed and that half of this amount was in sight when the petition was filed by the minority creditors. It is further contended that the truck is a good one and can be sold as fast as manufactured, and that additional capital is what is needed to make the concern a paying proposition.

## PREPARING FOR HUBER CASE

Detroit, Mich., Nov. 25—Preparations for the taking of testimony in the Emil Huber three-point suspension patent case brought by the North American Vehicle Co., owner of the patent, against the Detroit Taxicab and Transfer Co., which is being defended by the Kelly Motor Truck Co., maker of the trucks operated by the taxicab concern, are now under way. R. A. Parker, attorney for the plaintiff, states that in all probability the case will be begun in about 2 weeks, or as soon as the models which he is having prepared are completed. It will come before Judge Tuttle in the United States district court in this city.

## W., C. & P. SALE APPROVED

New York, Nov. 26—Following the favorable action by the creditors of Wyckoff, Church & Partridge, Inc., the United States district court has issued an order approving the sale of the assets of the embarrassed corporation to Chester Griswold, Howard C. Dickinson and George W. Ellis. The assets will be turned over to the committee on Saturday, the creditors receiving \$15,000 in cash in addition to certain credits that have been marshaled by the receiver, John S. Sheppard, Jr., which amount to between \$20,000 and \$30,000, all told. The settlement means something over 25 cents on the dollar.

The claim against the Driggs-Seabury

Ordinance Corporation and the counter claim of that company, together with the property of Wyckoff, Church & Partridge, Inc., held by Driggs-Seabury, are not considered in the settlement. A corporation to continue the business is in process of formation and its details will be announced subsequent to the actual consummation of the court action.

## WARREN CHANGES

Detroit, Mich., Nov. 23—At a meeting of the directors of the Warren Motor Car Co. on November 21, several changes were made in the personnel of the concern. Homer Warren was re-elected president; C. R. Wilson was made vice-president; F. T. Lewis, secretary, and L. M. Hamlin, treasurer. R. W. Allen, formerly secretary of the organization, was made general manager and assistant secretary and treasurer. Under the reorganization, the directors' committee consists of nine, as follows: Homer Warren, C. L. Wilson, C. H. Wilson, H. H. Bassett, S. G. Jencks, F. T. Lewis, John Mowe, G. Jahn and L. M. Hamlin.

## OVERLAND STOCK ON SALE

New York, Nov. 25—Advance offering of the recently purchased block of \$5,000,000 first preferred stock of the Willys-Overland Co. has been made by William Salomon & Co. The stock bears 7 per cent cumulative dividends. On the basis of last year's report of consolidated earnings, the company earned 66 per cent on the preferred issue. According to the Salomon announcement, the company sold 22,548 cars in the 1911-1912 season and for the year ending June 30, 1913, expects to put out 38,200. Figuring on that basis the bankers state that the company should earn full par value on the preferred issue offered.

## UNDERWOOD BILL NOT DEAD

New York, Nov. 26—The Underwood bill revising the tariff on metals, which was passed by both houses of congress early this year and which encountered the veto of President Taft, probably will form the basis of the new legislation to be adopted at the special session of congress next spring.

The metal schedule incorporated in the Underwood measure provided for a tax of 6 per cent on pig iron, 10 per cent on alloys and from 15 to 35 per cent ad valorem on various kinds of manufactured and partially manufactured metals. These rates represent a downward revision of from 2 to 25 per cent.

The free list under the Underwood bill includes iron ore, hoop and band iron, barbed wire, fence wire, cut and wrought nails, tungsten ores and a few other items.



# New York After 1913 Vanderbilt Race

NEW YORK, Nov. 26—The Motor Dealers' Contest Association of New York, composed of prominent members of the metropolitan trade, was formed Monday at a meeting attended by about forty. The purpose of the organization is to rehabilitate racing, road contests and tours and the main object that confronts it is the capture of the 1913 Vanderbilt cup race. The tentative plans of the association are to secure the race and run it on Long Island.

The association will be incorporated for \$30,000 and the shares will be sold among the trade, the individual concerns of which are limited to three shares each. The machinery of the organization will consist of a board of directors, numbering eleven, an executive committee consisting of eight and three committees respectively on racing, road contests and touring to be named by the board.

Temporary Chairman John C. Wetmore has announced the following committee to canvass the trade for co-operative support: George H. Robertson, William C. Poertner, Edward McShane, E. Lescaris, J. C. Nicholls, A. J. Inderrieden and E. F. Korbel.

## SUSPENDED BY A.A.A. CONTEST BOARD

New York, Nov. 23—At this week's meeting of the contest board of the American Automobile Association suspensions were handed out to some of the contestants in the recent around Lake Michigan reliability run of the Chicago Motor Club. For advertising stock car performances in a non-stock event the Moline Automobile Co. and the Staver Carriage Co., whose cars were the winners, were suspended from A. A. A. competition to June 1, 1913, while the Coey-Mitchell Auto Co. and the Stutz Motor Car Co., the latter Chicago agent for the Stutz, received a similar penalty for failing to start after entering and not being excused by the referee.

In the case of the appeal of the entrant of the Cadillac car in the Grand Rapids reliability run, the A. A. A. refused to overrule the finding of the referee of the Michigan event, who penalized the Cadillac 3 points because an outsider lifted the bonnet when the car was in control, the decision being based on the contention that the driver was negligent in permitting this.

## PREPARING FOR COAST TRIP

Indianapolis, Ind., Nov. 25—The Indiana Automobile Manufacturers' Association, at a meeting in the Claypool hotel in this city last Thursday night, gave the plan for a run from Indianapolis to the Pacific coast its unqualified indorsement. This means that the Indiana manufacturers will make the trip, and July 4 was selected tenta-

## Dealers Organize Association to Reclaim Classic for the East

tively as the date for making the start from Indianapolis.

This trip will take the place of the Indiana four states tour, which was held this year and last. It is estimated that a car with two occupants can make the trip for \$370, including the return trip by rail. The route has not been selected, and a committee is now working out this feature of the run.

H. O. Smith, of the Premier Motor Mfg. Co., has suggested that immediately following the arrival at the Pacific coast, exhibits of Indiana-made cars be held in Los Angeles, San Francisco, Portland and Seattle.

## OHIO'S ROAD WORK IN 1912

Toledo, O., Nov. 25—State Highway Commissioner James Marker has recently returned from a motor tour of the state during which he made a complete inspection of the progress of road building in the different localities. The state has thus far this year contracted for the construction of more than 140 miles of roads, and between now and January 1 about 25 miles more will be let. The state roads this year are being constructed chiefly of water-bound macadam, concrete or brick. The old style gravel road has received scant attention from the state department. Less than 5 miles of this style road was laid by the state this year. More than 62 miles of water-bound macadam roads were contracted for and about 41 miles of concrete. More than 35 miles of brick roads were built and 10 miles of bituminous macadam laid.

## ROAD MEETING IN NEBRASKA

Omaha, Neb., Nov. 25—The second annual convention of the Nebraska State Automobile Association was held at Lincoln on November 19 and 20. The reports read showed a very substantial growth during the past year.

B. A. George, president of the Lincoln Automobile Club, moved that the state secretary be instructed to invite eight Nebraska associations to appoint a committee of three from each association and confer with the legislative committee of the Nebraska State Automobile Association in order that all good roads interests in the state might unite upon a uniform highway commission bill, which it was planned shall be introduced at the coming session of the Nebraska state legislature.

The following officers were elected for the coming year: President, Dr. A. P. Overgaard, Fremont, Neb.; vice-president,

Lee Huff, Omaha, Neb.; second vice-president, G. E. Parisoe, Minden, Neb.; third vice-president, G. E. Glatfelder, Central City, Neb.; treasurer, E. R. Wilson, Omaha, Neb.; secretary, O. C. Turner, Omaha, Neb.; directors, B. A. George, Lincoln; C. O. Johnson, Havelock; Lee Huff, Omaha; E. R. Wilson, Omaha; Dr. A. P. Overgaard, Fremont; I. E. Doty, David City; D. S. Dalby, Beatrice; Ray Harrison, Grand Island; E. H. Mason, Bloomfield.

An invitation by the Hall County Automobile Association to hold the next annual convention at Grand Island was unanimously accepted.

## ANOTHER SPARK PLUG SUIT

New York, Nov. 26—Suit has been entered in the United States district court by the Rajah Auto Supply Co. against the American Auto Supply Co., charging infringement of the Mills patent, 825,856, covering porcelain spark plugs. While the patent itself forms the basis of the suit, the main contention is that the defendant company made a practice of advertising and selling the porcelain parts of spark plugs with which to repair Rajah plugs.

## GRABOWSKY COMPANY BANKRUPT

Detroit, Mich., Nov. 25—The Grabowsky Power Wagon Co. was adjudicated a bankrupt by Judge Tuttle in the United States district court on November 22. The concern will be operated by the receiver, the Federal Trust Co., until December 5, when a meeting of the creditors will take place, at which bids for the plant and equipment will be considered by the creditors of the concern.

## DURANT CHEVROLET PRESIDENT

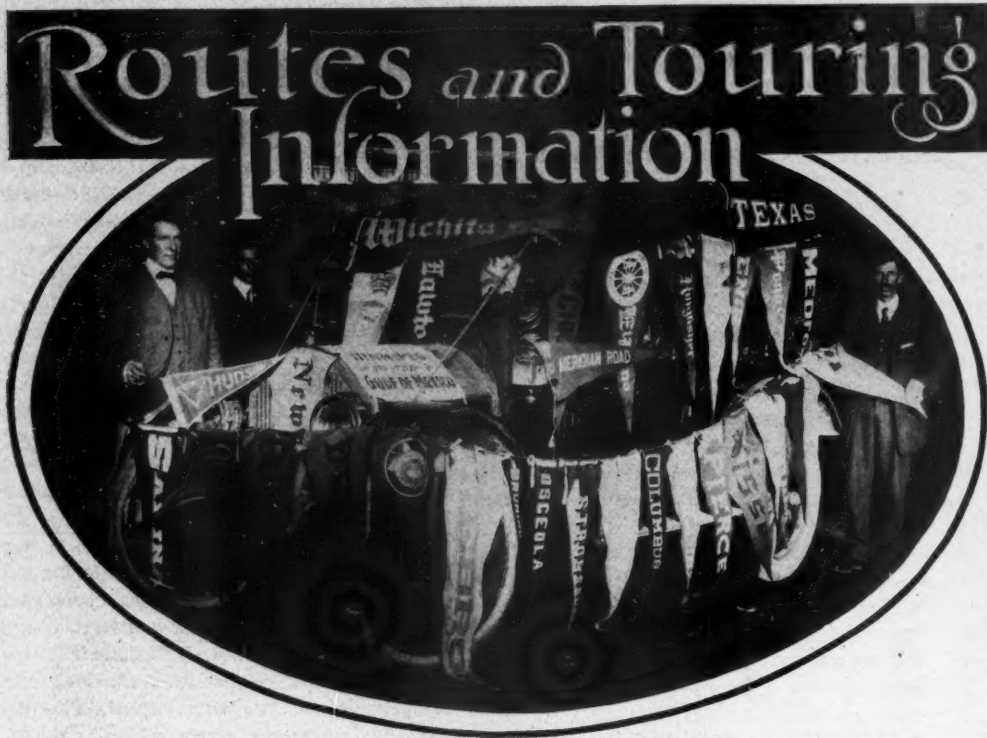
Detroit, Mich., Nov. 25—The following officers were elected at a recent meeting here of the board of directors of the Chevrolet Motor Co., Flint, Mich.: W. C. Durant, president; J. D. Port, vice-president; W. H. Little, second vice-president; Dr. E. R. Campbell, treasurer; C. R. Hathaway, secretary; W. M. Murphy, assistant secretary, and F. A. Aldrich, assistant treasurer.

## DAIMLER FILES SCHEDULES

New York, Nov. 26—Schedules in bankruptcy of the Daimler Import Co. show liabilities of \$67,261 and assets of \$4,626. The latter consist of a car, spare parts, accounts and a bond for \$2,000. The liabilities consist of claims by Lawrence F. Braine and the New Netherlands Bank, H. A. Content and others.

## MCGUIRE JOINS FLANDERS

Detroit, Mich., Nov. 23—The Flanders Motor Co., has added W. F. McGuire, formerly of the Ford Motor Co., to its staff as production manager.



CAR THAT CARRIED MERIDIAN ROAD INSPECTION PARTY

## Meridian Road Already Half Completed

By John S. Nicholson

THE Meridian road is a first-class road for more than 1,000 miles, or about one-half of its entire length. An official inspection party recently passed over it from Winnipeg, Man., to Wichita, Kan., over 1,000 miles in 8 days, or an average of about 130 miles per day. No attempt was made to cover long distances or to run at high speed, and the whole trip was made as per schedule prepared in advance.

From Winnipeg to White Rock, in South Dakota, a distance of 350 miles, the road is located on the west bank of the Red river of the North and is level as a floor almost the entire distance and for the most

part is a fine road, except in wet weather, and for that portion between Winnipeg and Morris, a distance of 40 miles, the land is quite low and the soil correspondingly sticky. The Meridian road officials found this stretch of road to be in frightful shape. The inspectors were accompanied by Mayor Waugh, of Winnipeg, and Mayor Berry, of St. Boniface, both of whom were thoroughly impressed by the unsatisfactory condition of the road. It is expected that action will be taken toward macadamizing it. Owing to the fact that this district is settled by com-



INSPECTION PARTY AT HEBRON, NEB., AFTER A FISH BREAKFAST



THE MERIDIAN ROAD



it seems entirely improbable that they can do much toward keeping the road in condition. Winnipeg, however, requires a trunk highway outlet to the south for tourist travel, and the province will undoubtedly assume the construction of this highway.

#### Route of Meridian Road

A first-class dirt road is being constructed from White Rock to Sisseton and from Sisseton south across the Coteau hills, which forms the continental divide between the Hudson Bay and the Gulf of Mexico. From the Coteau hills the slope is south toward the Gulf of Mexico, with an excellent dirt road all the way as far south as Oklahoma, except the Platte river bottom in Nebraska and the sand bar south of the Missouri river, south of Yankton. From Wichita south over the Chisholm trail is a first-class dirt road to Enid, Okla. Between Enid, Okla., and Wichita Falls, Tex., we passed over stretches of good, bad and indifferent roads, but this is the best and about the only road for a motor car into or out of Texas. Considerable sand is encountered, but all the streams are bridged except one, Medicine creek, on the Fort Sill reservation, which can be easily forded, and Chandler creek, where a bridge is in the course of construction. From Wichita Falls to Fort Worth the motorist has his option in taking the shorter route through Henrietta with much sand or the longer route through Jacksboro where for many miles it is a mere trail. From Weatherford to Fort Worth is a very good road, while the road from Fort Worth to Dallas is an important thoroughfare, not in good condition, but is receiving attention.

We made the official inspection trip from Wichita, Kan., to Fort Worth over the Chisholm trail via Burkeburnett bridge in 4 days. From Wichita south through Winfield and Arkansas City, Guthrie and Oklahoma City, thence west 30 miles to El Reno, where it connects with the Chisholm trail, is an optional route, and it is

proposed to extend this road south from Oklahoma City through Purcell, where it crosses the South Canadian river on a new \$100,000 bridge to Dallas or Fort Worth, but this section of the road is not completed yet. At present there is only one and that is the Burkeburnett bridge on the Chisholm trail between Lawton and Wichita Falls. The M. K. & T. railroad bridge north of Denison has been planked so that vehicles can pass over it, and we believe that these two bridges are the only wagon bridges over the Red river. The Red river, the South Canadian, Cimarron and other streams in Oklahoma are treacherous and not safe to ford, so that it is almost necessary to enter Texas from the north via the Burkeburnett bridge or the M. K. and T. bridge.

#### Texas Proposes Improvement

Think of it, Texas with her 40,000 motor cars, and outside of it tens of thousands that would like to enter and not a highway worthy of the name into the state from any direction. Certainly this condition will not long exist. There will be built, and that right speedily, a first-class dirt road connecting Dallas and Fort Worth, and nearby cities with a population of over 200,000 people with Oklahoma City

with tributary cities of over 200,000 people. Oklahoma would have to build most of this road. Texas will push the road on south to the Gulf of Mexico, to Houston and Galveston with a population of 150,000, and southwest to San Antonio, with its population of over 100,000, and on to Corpus Christi or some other gulf port. Around Houston is 300 miles of shell road as fine as to be found anywhere, and in southwestern Texas are hundreds of miles of dirt roads, their equal hard to find anywhere.

The Meridian road has not been definitely located across Oklahoma or Texas, but will be in the near future when the line will be complete from Winnipeg to the Gulf of Mexico.

#### Cost of the New Road

The International Meridian Road Association is less than a year old and in the first year of its existence there has been expended upon the Meridian road more than one-third of a million dollars. For the first 6 miles out of Winnipeg there is being constructed a cement road costing over \$30,000. Across South Dakota for permanent bridges, cement culverts and grading \$40,000 has been expended; across the Coteau hills in Roberts county, South Dakota, an entirely new road is being constructed with maximum grade of 6 per cent crossing an elevation 800 feet higher than the surrounding country and 12 miles across. In Coding, Kingsbury and other counties, road building bees were held and a first-class dirt road constructed by donation. In nearly every county new bridges were put in, cement culverts, etc., and the expenditures in South Dakota will easily



DRAGGING MERIDIAN ROAD IN GRAND FORKS COUNTY WITH GAS TRACTOR



ROAD MAKING CREW AT WORK NEAR MADISON, NEB.

paratively few farmers, aggregate \$75,000. In Nebraska for permanent bridges, cement culverts and new grading, and improvements under the government supervision south of Columbus, in the Platte river valley, there has been expended at least \$50,000. In Kansas, the Meridian road in seven counties was declared a county highway and is being constructed and maintained at county expense. Cowley county in the construction of a concrete reinforced bridge across the Walnut river has spent \$20,000 and built a rock road through Arkansas City and Winfield costing \$59,000, which rock road will be extended across the county next year. The total expenditure this year on the Meridian road in Kansas exceeds \$150,000.

**Bridges and Culverts Needed**

In Oklahoma, on the Chisholm trail, cement culverts and reinforced concrete bridges are going in and much grading is being done which will aggregate at least \$50,000. In Texas \$1,000,000 in bonds has been voted for roads in Tarrant county and \$600,000 for bridges, while Dallas county has recently constructed over the Trinity river, between Dallas and Fort Worth, a reinforced concrete bridge costing \$700,000. Other counties have voted road and bridge bonds and in the near future Texas will have some fine roads.

Motor car traffic over the Meridian road has grown rapidly but has been diverted this year to other roads on account of the large amount of improvement being made. On our inspection tour we found it necessary to go around scores of new bridges and new culverts. Signboards have been placed about one-half the way between Winnipeg and Oklahoma, and the road will be distinctly posted all the way between Winnipeg and the Gulf of Mexico by spring, except possibly a part of the Texas and Oklahoma division, which will be sign posted as soon as definitely located.

#### Method of Signboarding

The Meridian Road Association adopted as its emblem the red arrow on a white background, with letters "W" in the head and "G" in the tail of the arrow, with Meridian road printed thereon with space for the printing of the local towns north and south with the distances thereto. It

also adopted for a pole sign a red band, 12 inches in width over a white band 12 inches in width, which sign it is proposed to use for the entire length of the road and to put them up so frequently that the traveler will know at all times that he is on the right road.

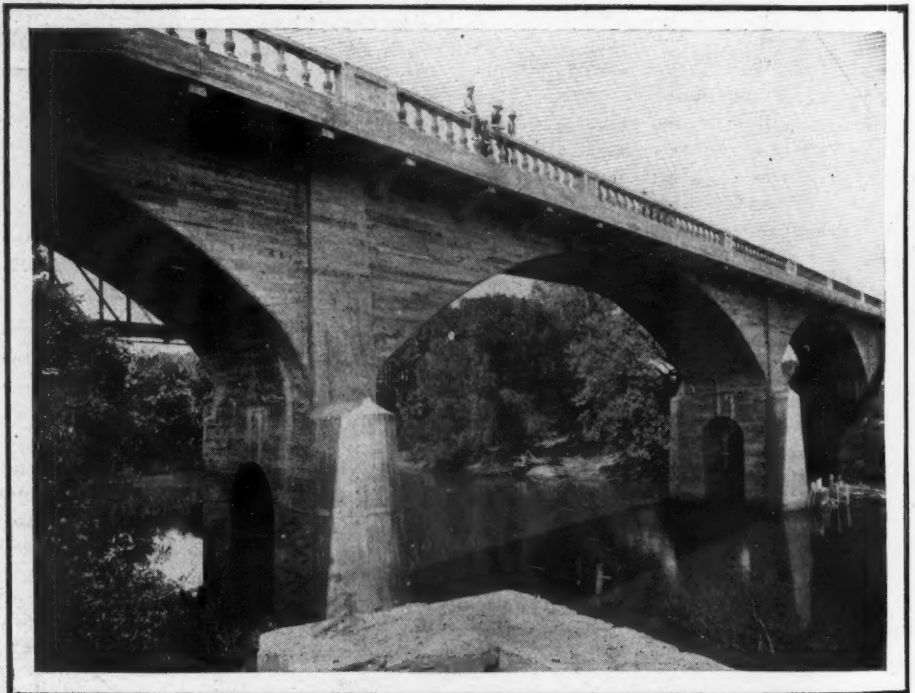
Different methods of erecting the signs have been employed in the various states. In North Dakota the work of signboarding has been done in a very thorough manner, and the tourist can follow the road with ease from the signboards alone. A rule has been established that the signs be erected on specially prepared posts painted white with the sign 6 feet from the ground. At every turn two signs are used, and in most of the counties the names of the towns with mileage both ways have been painted on the signs so that the tourist has very complete information both as to the route and as to where he may happen to be. In Kansas and Nebraska a map sign has been erected at each turn of the road, with the names

of the cities thereon through which the road passes.

Between Winnipeg and Wichita the Meridian road needs a bridge across the Missouri river at Yankton and an improved highway across the Platte river bottoms in Nebraska, and the completion of the road across the Coteau hills in South Dakota. At present the Missouri river is crossed on a pontoon bridge or ferry and is open the year around.

#### Scenic Features of Route

The Meridian road passes through the Bread Basket of the north and between lakes and summer resorts of the Dakotas and Minnesota, through the fine corn fields of Nebraska, between wheat and corn fields and orchards of Kansas, into the immense cotton fields of Oklahoma and Texas, to the sub-tropical fruit region on the Gulf of Mexico. The road follows very closely the ninety-seventh meridian of longitude and from sea level at the gulf rises to 2,000 feet, the summit of the Coteau hills, thence sloping downward toward the north



CONCRETE SPAN OVER WALNUT RIVER AT WINFIELD, KAN.



TYPICAL VIEW IN GRAND FORKS COUNTY, N. D., THROUGH WHICH MERIDIAN ROAD RUNS





MERIDIAN ROAD AS IT RUNS THROUGH WALSH COUNTY IN NORTH DAKOTA

to 700 feet at Lake Winnipeg, without a hill too steep for a car to climb on high gear.

#### Aspirations of Association

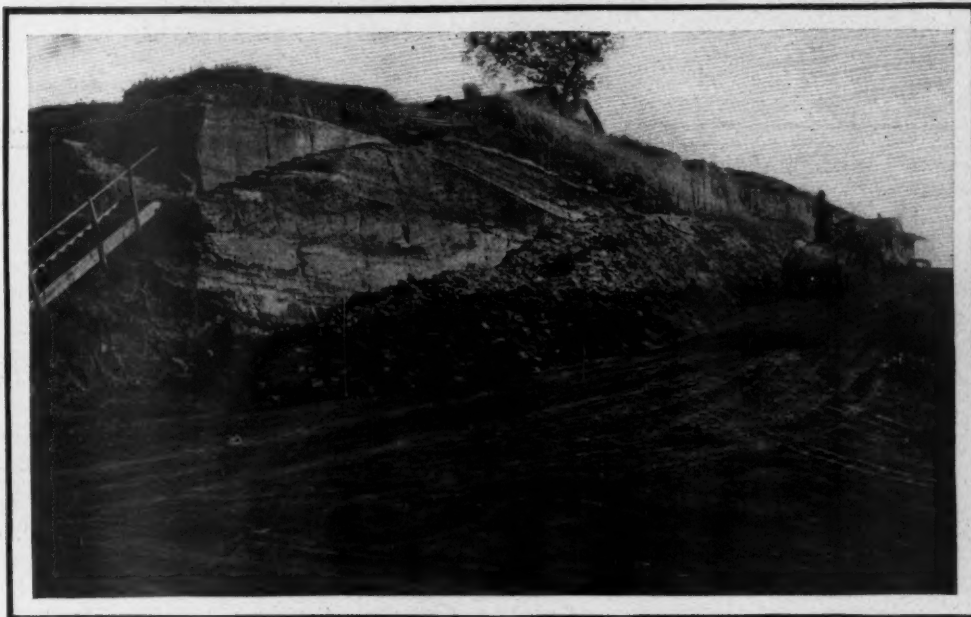
It is the purpose and intent of the association to secure the construction of a road, over every part of which a full wagon box load or a car at high gear can pass, except in wet weather. It is anticipated that in the near future thousands of business men and retired business men will take their families in their motors and proceed northward at slow stages for their summer vacations, among the lakes in the north latitudes, and that in the fall the retired merchant or banker will take his family in his car and leave the rigorous winters of the north to spend a few months in the salubrious climate of the gulf coast. Our party proceeded over this entire route without an incident to mar the pleasure of the trip. Good hotels and good garages are to be found every few miles in the sixty odd cities between Winnipeg and the gulf.

All along the route great enthusiasm over the project is being shown and it is anticipated that it will not be long before the whole trail will be completed and ready for motorists.

#### TOURING IN ALABAMA

Greenville, Ala.—Editor Motor Age—Early in September a party consisting of my father and family toured the entire northern part of Alabama in our 1912 Chalmers seven-passenger car. We had a most delightful trip of about 10 days, stopping at all the principal towns and points of interest along the route. We would spend a day or so in each place. Including the drives through the numerous parks and over the many cities we visited, our speedometer registered about 800 miles. We were not trying to break any speed record or cover any unknown territory but our trip was strictly one for pleasure and our vacation period. The itinerary was as follows:

Leaving Greenville early one morning we drove 24 miles to Highland Home over hills and through sand, but here the



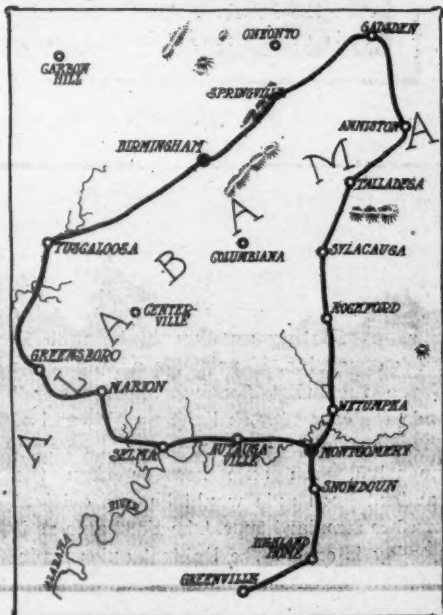
CUTTING MERIDIAN ROAD THROUGH HILLS AT CONCORDIA

roads changed and we had fine sailing to Montgomery, 30 miles. Leaving Montgomery we crossed the river on the ferry about 10 miles out and arrived at Autaugaville over fairly good roads. Selma was our next stop and we had no trouble with the

roads even though there were some bad hills to climb. It is smooth sailing part of the way to Marion, but the other part is rough and newly worked. There is a sand road to Greensboro. Within a dozen miles or so of Tuscaloosa the graded work begins. The balance of the way to Birmingham is fine roadway and is good for motoring.

From Birmingham to Springville we had a fine road but to Gadsden it was bad, and continued so part of the way to Anniston gradually getting fair through Talladega down to Talladega Springs. To Columbiana through Sylacauga and Rockford it was again bad, and we were caught in a hard rain going over the new road to Wetumpka. For a few miles out of this town the road was bad but fine on into Montgomery.

This made our round trip and only had trouble on one slick hill near Rockford where a team was needed a few minutes. I would not advise a trip over this and adjoining counties during the winter, after the rains set in, but it is all right when dry. Work has started on our country roads and we hope to have some good ones before very long.—T. W. Peagler.



CIRCLE ROUTE IN CENTRAL ALABAMA

## Decoration for Parade

### Elaborate Floral Design for Motor Car Display Float Designed for Native Son

ONTARIO, CAL.—Editor Motor Age—What is the approximate horsepower of the 1910 National?

2—With a 3 to 1 gear and 37 by 4½-inch tires, what is its speed?

3—Would like some suggestions for decorating my National car for a parade.—R. C. Hammel.

1—The National 40 motor, 1910 model, developed from 43 to 87 horsepower at various speeds from 800 to 1,800 revolutions per minute, as shown in the horsepower curve, Fig. 2.

2—This depends, of course, entirely upon the type of body used and the weight in equipment and passengers carried. Seventy miles per hour is claimed as possible for these cars, with a 3 to 1 gear, 37-inch tires, and a normal load.

3—Motor Age has from time to time published illustrations of motor cars decorated for floral parades in the From the Four Winds column. Figs. 2 and 3 show a locomotive design that is original and which could very effectively be adapted to a large car. It would be built of wood strips, covered with canvas, and decorated with flowers. The cab would cover the tonneau, while the driver would occupy the fire-box. The front view illustrates the opening through which he looks. Passengers in the cab would be dressed in engineers' clothing, overalls and jumper, and would lean out of the windows. The steam dome, sand box, bell and stack may be made of cardboard, and the bell covered with gold paper. The latter may be a real bell, if available. The front wheels would be concealed by dummy cylinders, and dummy drive-wheels would occupy the running-boards. Behind the cab would be a tender, made on a large square framework, and running on a pair of small go-cart wheels. The front is supported by a light draw-bar, secured to the rear of the car on a pivot. The effectiveness of this design will depend, to a large extent, upon the care with which the details and proportions are carried out. A striking effect would be secured by covering the boiler and tender with ferns, picking out the working parts and accessories with colored flowers. The number on the side of the tender should be in white flowers, while the owner's name may be lettered in small white flowers under the window of the cab.

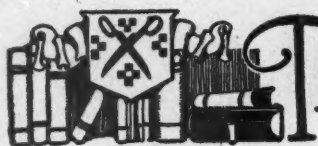
#### FLOATING AXLE FOR FORDS

Fontana, Kan.—Editor Motor Age—What are the names of cars under \$1,500 with floating rear axles?

2—What are the names and addresses of cars with friction drive?

3—What is the speed of the American Scout?

4—How can one prevent grease from



## The Readers

### Suggestions for the Decoration of a National for Exhibition

#### —Horsepower Chart of National Motor—Information on Air-Cooled Car—Regarding Suggested Change in Ford

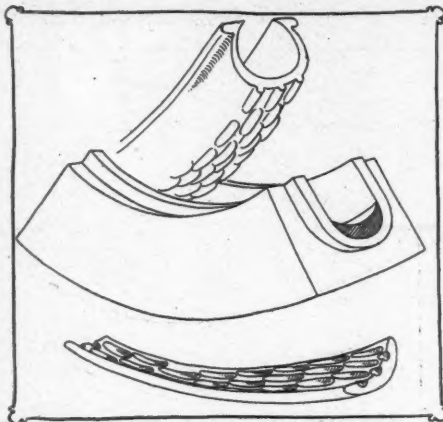


FIG. 1—HOW NON-SKID TREAD IS SECURED IN REPAIR

working out on the rear wheels of a Ford, and could a floating rear axle be put on a Ford?

5—What was the output of the Metz, American, and Detroit for 1912?—Harry Gardner.

1—Detroit, Cameron, De Tangle, Mitchell, Hupmobile, Courier.

2—Cartercar, Cartercar Co., Pontiac, Mich.; Lambert, Buckeye Mfg. Co., Anderson, Ind.; Petrel, Petrel Motor Car Co., Milwaukee, Wis.; Sears, Sears Auto Co., Chicago.

3—About 45 miles per hour.

4—Grease should not work out on the drums if a sufficiently stiff grease is used, and if not filled above the filler plug at the rear of the housing. The felt washer at the ends of the axle tubes may need replacement. To put a floating axle on a Ford would be like fitting diamond jewels in a low-priced watch. Such a watch was designed for steel bearings, and will keep good time so equipped. To install costly jewels in their place would be a useless extravagance.

The Ford rear axle gives good satisfaction as it is, since it has a light load, is itself light, and carries its load near the hubs. A floating axle would be prohibitively expensive, if properly adapted, due to the fact that floating axles are not made for cars of such light weight, and of course specially made axles would be very expensive. An axle heavier than the standard Ford axle would be less efficient than the standard type. The Ford axle as it is today is one of the lightest axles made, and as adapted to the Ford design in general, doubtless is the best for the purpose. A change in the axle design would neces-

**EDITOR'S NOTE**—To the readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department, not necessarily for publication but as an evidence of good faith. Motor Age will not publish communications where this rule is not lived up to.

sitate a change in wheels, as Ford wheels could not be used with a floating axle. The peculiar spring suspension of the Ford would require that the axle be specially made for this use, the cost of which would be prohibitive. A new Ford axle may be purchased for \$50, which makes a more elaborate axle unnecessary.

5—Five thousand Metz cars were built in 1912, according to the maker. The output of the Briggs-Detroit Co. was 1,000 cars, according to that company.

#### CONCERNING THE CAMERON

Rice, Kan.—Editor Motor Age—I would like to know if the Cameron Car Co., of Beverly, Mass., is still making cars. If it is, what are the specifications of the 1913 cars?

2—How many cars did it make in 1910, 1911, and up to the present time in 1912?

3—How many cars did it sell in 1910, 1911, and up to the present time in 1912?

4—In what part of the country does it make the most sales?

5—Does it have more than one factory?

6—Is the Cameron car considered as successful as the Franklin in cooling?

7—Has the Cameron ever entered in any endurance races or contests in the last 2 years? If so, what was the result?

8—What is the ratio of the gears of the 1912 Cameron fours and sixes, low gear, intermediate and high?

9—What make of magneto is used on 1912 cars; also what carbureter?—A Reader.

1—The Cameron for 1913 will appear in four types of pleasure car chassis. The salient features are air cooling, leather-faced cone clutch and Cameron rear-axle gearset. Two of these models are rated at 24-horsepower and two at 36-horsepower. Each has four cylinders, three speeds, with a variety of body styles.

2—500, 600 and 500, respectively.

3—500, 600 and 500, respectively.

4—West.

5—Yes, at Beverly, Mass., and Attica, O.

6—Motor Age has no record of any comparisons of the cooling of these two types,



# Clearing House

Where the Old Cars and Their Masters Go—Causes of Motor Knocks Are Numerous—Carpenter on Spark Plugs—Effect of High Compression Explained—Vulcanizing Non-Skids

**EDITOR'S NOTE**—In this department Motor Age answers free of charge questions regarding motor problems and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear he may adopt a nom de plume.

but both are considered well cooled.

7—In 1910 the Cameron won five first prizes. The Cameron also has won several races on the Brooklands track, England.

8—The gear ratios of model 28, the four-cylinder model 1912, are,  $9\frac{1}{2}$  to 1 on first speed,  $4\frac{1}{2}$  to 1 on second and  $3\frac{1}{2}$  to 1 on third, total reduction. On model 32, the six-cylinder, these are respectively 12 to 1,  $5\frac{1}{4}$  to 1 and  $3\frac{1}{2}$  to 1.

9—The ignition system is optional.

## POUNDS UNDER LOAD

Menard, Tex.—Editor Motor Age—I would like you to tell me what is the trouble with my car, Moline M 35, equipped with a Schebler model L carbureter and Splittorf magneto. Running idle, the engine runs smoothly, but after the car is started and thrown into high gear, especially on a slight pull, when the throttle is opened, the engine will pound and knock, finally stopping if not thrown into first or second speed. On the first and second speeds there is no pounding. The car has been giving fine service up to a short time ago, when the trouble started. I first thought it was due to carbon, but the engine has been cleaned and is in good shape, or apparently so.—J. D. S.

There are two principal causes of pounding under load, when the engine runs well idle or in the lower reductions. One of these, and the most frequent, is improper handling of the spark. Drivers of long experience will often become careless and carry their spark too high in the mistaken idea that to do so will give a snappier action, or in search of economy of gasoline. Often too this is the result of carelessness, thoughtlessness or ignorance. Whether any of these fit your case you must determine by self-analysis in driving. Try carrying your spark in the retarded position when taking a load, as in starting and climbing through the gears. If this does not avail, you are not to blame, as the car is out of proper adjustment.

Loose bearings would manifest themselves in this way. Whether or not these are the offending members may be deter-

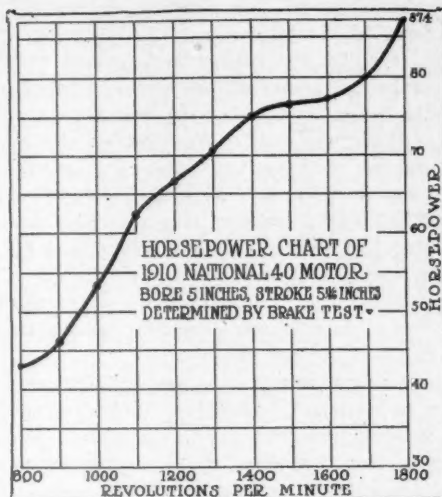


FIG. 2—BRAKE-TEST CURVE OF NATIONAL 40 MOTOR

mined by running the motor idle, alternately and in quick succession accelerating and retarding the motor with either the spark or throttle, preferably both. The bearings will click at each change in speed. If this does not prove to be the case, the trouble is not so deep-seated.

Perhaps the most prolific cause of this difficulty second to mishandling of the spark is poor carbureter adjustment. Either an overrich or starved mixture will produce this effect. A mixture that is too rich will produce fair results at slight throttle openings, but when the throttle is opened wide and a severe load applied to the engine, it will choke up through lack of sufficient air to properly burn the excess of gasoline. A moderately starved mixture, on the other hand, will give very poor power, although with light loads the motor may appear to run properly. Which condition obtains may be determined by running the motor at medium speeds, first obstructing the air, and then forcing the air-valve open with a pencil. If the motor speeds up momentarily when the air is shut off, the mixture is too lean, and the carbureter should be adjusted accordingly. If it speeds up when the air-valve is opened, to the contrary, the mixture is too rich and should be thinned.

If the carbureter is found to be in perfect adjustment, or if after correctly adjusting it, the lack of power on high remains, the trouble must lie in the spark-timing. The advance must be too far, and the retard not far enough, so that it is impossible to sufficiently retard the spark.

## Some Racing History Whereabouts of Famous Racers and Drivers, and Operation of Warner Device

ATLANTA, GA.—Editor Motor Age—What has become of the big 90 horsepower Locomobile which won the 1908 Vanderbilt race?

2—What has become of the twelve-cylinder 180 horsepower Maxwell which turned up a mile on the Atlantic City beach in 1909 in :39 1-5? Is this record regarded as official?

3—How is the Warner timing apparatus arranged so as to compensate for the action of the rear wheels when a car hits the tape?

4—What has become of the Old Guard of motor car racers, such men as George Robertson, Herbert Lytle, Victor Hemery, Felice Nazzaro, Walter Christie, Billy Knipper, Jimmy Ryall, Joe Tracy, Joe Kilpatrick, Montague Roberts, Mortimer Roberts, Winters, Salzman, Frank Lescault, Ray Harroun, DeWitt, Harry Grant, Bert Dingley, Ray McNamara, Albert Denison, Charles Basle, etc., men who were considered the leading lights of the racing world?

5—Who is acknowledged to be the amateur champion of America at present? Has Bruce-Brown's amateur flying mile in :33 with the Hemery grand prize Benz in 1908 ever been bettered? If so, when, where and by whom?—J. N. Brightwell.

1—The Locomobile that won the 1908 Vanderbilt is on exhibition at the Chicago Locomobile branch, where it has been for several years.

2—Motor Age does not know. The mark in question is not in the record book of the A. A. A.

3—No compensation is provided. The device registers each time the tape is depressed. The first registration counts.

4—Robertson is president of a motor supply business in New York and has retired from racing. Lytle also has quit and when last heard from was connected with a car agency in Indianapolis. Hemery raced in the 1912 French grand prix. Nazzaro has quit and nothing has been heard of him this year. Christie had enough 2 years ago, while Knipper is the Stutz agent in Rochester, N. Y. Ryall has dropped out of motoring apparently. Tracy is a consulting engineer in New York. Montague Roberts is in the engineering department of an eastern car-making concern, but his brother, Mortimer, still races, he having won the Pabst trophy at Milwaukee. Kilpatrick is with Moross and Burman. Motor Age has no recollection of Winters. Salzman was with the Amplex until recently, but not racing. Lescault's whereabouts are unknown. Harroun retired after winning the 1911 Indianapolis race and is a motor car engineer. DeWitt is in Texas and Harry Grant at his Massachusetts home. Grant has been in one track race this year. Ding-

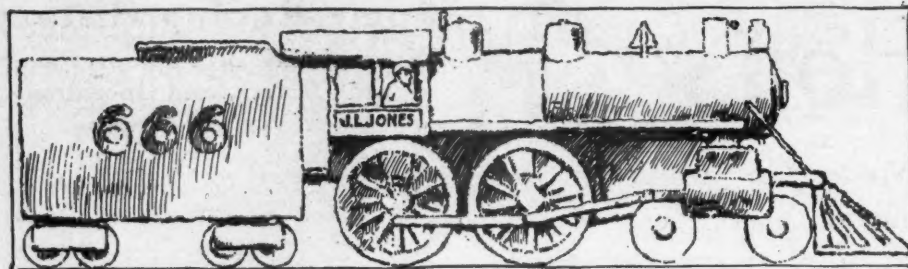


FIG. 3—ORIGINAL DESIGN FOR PARADE FLOAT

ley has retired and is the National agent in Los Angeles. McNamara never raced. He still is in the employ of the Premier company. Denison quit the racing game after his mate, Bourque, was killed at Indianapolis. Basle has not raced this year.

5—There is no American amateur champion. So far as known no amateur ever beat the mile in :33 made at Ormond by the late David Bruce-Brown. When the American Automobile Association ruled that amateurs could not compete against professionals, the bottom dropped out of the amateur end of the sport.

#### SPARK PLUG TROUBLES

Sauk Center, Minn.—Editor Motor Age—I have learned by experience that the spark plug as now constructed is most to be blamed for the poor operation of the motor. At least this is what I have found by taking notes and investigating the real cause of the ordinary miss-fire. As a matter of fact there are other causes which cause a miss, such as too rich mixture, too thin mixture, defective wiring, run down batteries, poor contacts, valves not closing properly, too weak valve-spring, out of order magneto, water in the gasoline, improperly adjusted carburetor, vibrator too tight or too loose, obstruction in the supply pipe, leaking intake connection, and short-circuited plug.

I recall one incident which will be useful to a good many motorists who will readily appreciate the explanation in my experimenting. A four-cylinder motor was in the habit of continually missing and one day I was at the owner's place on a visit when we got busy on motor topics, and he mentioned the trouble he was having and asked me if I could suggest a remedy.

I told him there were so many causes incident to a miss that I really could not suggest anything logical without seeing the motor. We went to the garage and he started the motor and the miss was much in evidence, causing the car to tremble violently and being most disagreeable with its noise. I went over the whole system of ignition and soon found that everything was O. K., with the exception of one plug, which was either broken or short-circuited in some way. I took the small blade of my knife and carefully scraped out the carbon deposit inside of the porcelain and then with a brush I washed the balance of the carbon out and was not surprised to see, on laying the plug on the cylinder head, a good fat

spark between the positive and negative poles of the plug.

It seems the carbon had formed a sort of bridge across on the inside well up in the plug, and here was the reason the cylinder was dead. We replaced the plug and as soon as the motor was cranked away it went as if nothing had happened. What was surprising was that this same plug had done good work before, and here it now refused to do anything. The owner declared that the porcelain was cracked, but a careful examination proved that this was not the cause.

A new plug placed in this cylinder would give its spark instantly, which fact went to show the wiring was all right. After the test we scraped some carbon and placed it in the plug and thereby made a temporary short-circuit.

Electricity is sure to always take the shortest route home, and carbon is a fine conductor for it. It is a good plan, I find, to take the plugs out and give them a good cleaning every 500 miles, and the owner will be repaid by increased flexibility of his motor. This advice applies to all plugs, high or low cost, but as a matter of fact the properly constructed plug will give far better satisfaction than the poorly made one, although the latter may do good service for a time. Some plugs are made with the porcelain hole too small, thereby aiding in forming with carbon a short path for the electrical current, insuring its not coming to the plug points.

If your motor misses take a look inside the plugs and be sure they are clean and the points not too far apart. You, no doubt, have been troubled with more or less missing of cylinders, and if everything else is found O. K., look inside of each plug and your trouble will be found nine times out of ten.—A. D. Carpenter.

#### DE TAMBLE REAR AXLE MAKERS

Sauk City, Wis.—Editor Motor Age—Who made the rear axle in the De Tumble five-passenger machine, and where can I get parts for same? Also, is there a clutch on the market that can be put in place of the De Tumble clutch without much trouble or making many changes?—Theo. Decot.

The De Tumble Motors Co. purchased all of the rear axles used on its 1911 models from the Sheldon Axle Co., Wilkes-Barre, Pa. Motor Age has never heard of a clutch interchangeable with the De Tumble type, and it would probably involve considerable work to change the equipment in this particular.

## Compression and Ignition

### Reader Quotes Old Paper in Rebuttal of High-Pressure Theories Herein Advanced

GREENFIELD, TENN.—Editor Motor Age—In answer to my query published in your issue of October 10, you state that compression sufficient to ignite a charge would have to reach a degree of pressure in excess of 400 pounds to the square inch. Is this correct? In the report of tests made by Robert M. Strong and published by the United States Geological Survey, which appeared in Motor Age, October 28, 1909, the statement is made that a compression pressure of 70 pounds per square inch above atmospheric pressure, was found to be the maximum that could be used for gasoline mixtures without causing pre-ignition. If this is true would you not modify your answers to my second and third questions? Would it not also simplify greatly your answer to E. Rozier on the subject of high compression motors in the October 17 issue?—Harry C. Ward.

The report of Mr. Strong was made 3 years ago. Since that time the high-compression engine has come in for considerable development. The figure 70 pounds is extremely low, and must have been the result of carbon in the cylinders or faults in casting of the engine under test. Pre-ignition, in this case would not be the result of the heat of high compression, but would be the effect of the carbon or defective casting. In a perfectly clean cylinder, the experiments and practice with Diesel engines indicates that to satisfactorily explode a charge in a gasoline engine by compression alone, requires a compression of 500 pounds to the square inch.

On the other hand, it is no doubt true that a compression of 80 to 90 pounds in the ordinary engine would cause pre-ignition, because the engine is not designed for such pressures, the cylinder heads are not machined, and the interior surfaces and joints are not designed with sufficient care to prevent the formation of a carbon point. But the ordinary engine never reaches this point.

Your assumption that the compression in a motor is higher when pulling hard is not correct. The piston pressure upon explosion is higher, but the compression is in no wise changed, with the throttle open, by any increase of load. Therefore compression can have nothing to do with spark knocks in a normally smooth-running engine. The answer to E. Rozier in the October 17 issue is correct.

Engines expressly designed for the purpose can operate at compressions greatly in excess of that possible in those designed for moderate pressures. Were it not for the other considerations involved, as explained to Mr. Rozier in the reply referred to, it is probable that high pressure engines would become the rule rather than the exception.



## Vulcanizing Safety Tread

### How Special Treads Are Transferred to Newly Vulcanized Portion of Tires

**K**INMUNDY, Ill.—Editor Motor Age—Where would it be possible to secure molds to place inside a Miller cavity steam vulcanizer, for putting on Bailey treads, safety treads, etc., on repaired portions? When nothing is used the tire comes out of the vulcanizer smooth wherever it touches the mold. We have tried using plaster paris but this seems to hold the heat back and requires twice as long to cure a patch and the mold breaks when the tire is lifted out.—Kinmundy Garage.

The demand for a non-skid vulcanizer is comparatively new, and you undoubtedly have brought up a question that is very pertinent at the present time. The newer models of Miller vulcanizers are made with a detachable tread piece, which can be engraved with any form of non-skid tread desired. This process is expensive, however, and as it is assumed that your vulcanizer is not of the new type, it probably would not be available.

The more common method of accomplishing this is by laying a piece of raw rubber in the bottom of the vulcanizer and placing the tire to be repaired thereon, at a point where no repair is necessary, and the tread is in good condition, as in Fig. 1. This gives a duplicate impression of the tread. This rubber strip is made from regular tread stock or a special tread stock prepared with powdered asbestos by the Miller company. This strip is cured and laid aside. The portion to be repaired is then vulcanized in the usual manner, up to the last or tread cure, when the rubber tread pad, which previously has been prepared, is placed in the vulcanizer before application on the tire. It should be dusted with talc before applying to prevent sticking. The tire is then given the final cure, and the tread mould removed. The result is an exact duplication of the original tread. Such a tread would transmit the heat readily and may be used repeatedly.

#### STRAIGHTAWAY RECORDS

Coldwater, Mich.—What is the American record for steam and gasoline cars on straightaway and flying start. Please give name of car and driver.

2—The best time for the Ford model T, and Ford special for 1 and 2 miles.—G. F.

1—Frank Marriott in a Stanley holds the steam mile record, :28½, made at Ormond, Fla., January 25, 1906. Bob Burman in a Benz has the gasoline mile record, :25.4, made on the same beach in March, 1911.

2—The Ford has no official records for the distances mentioned.

#### GEARSET AND AXLE TYPES DEFINED

Clark, Mo.—Editor Motor Age—What does Motor Age think are the advantages of the extremely long-stroke motor, say 7-inch stroke with a bore of 4¼ inches? Would not the same motor develop as much power if the bore was the same and the stroke was only 6 inches, which is considered a long stroke?—Reader.

The advantages of long strokes have been discussed at considerable length in these columns in the issues of October 31 and November 14, 1912, and if the reader will refer to his back files he will get sufficient information to enable him to understand the subject in a general manner. As horsepower is measured to a certain degree by piston displacement, a motor with a 4¼-inch bore and a stroke of 7 inches would develop more power than a motor with the same bore, but with a stroke of but 6 inches. To be explicit, by the modified S. A. E. formula, published in Motor Age July 25, 1912, the horsepower of the 7-inch-stroke motor would be 46 if of four cylinders, while that of the 6-inch-stroke motor but 40, both ratings assuming a crankshaft speed of 1,400 revolutions per minute. This assumes that the valves, etc., are designed for this stroke.

#### LONG STROKE AGAIN

Omaha, Neb.—Editor Motor Age—Kindly explain the difference in selective, progressive and planetary transmissions.

2—What constitutes a floating semi-floating and three-quarter axle, and what are the advantages in either over the old style.—J. W. Kennedy.

1—The selective and progressive types of gearsets belong to the sliding-gear group, and differ in that the changing of gears in one case must be always in regular order, as indicated by the term progressive. This means that in the progressive type of sliding-gear transmission, to reach a given gear from neutral, all of the gears intermediate must first be passed through. In

the selective type, however, from neutral any gear may be reached direct, or selectively, as the term indicates.

The planetary gearset consists of a gear pinion and an internally-toothed gear ring, between which, and meshing with the teeth of which, planetary, or revolving, gear-pinions are placed. These pinions are secured to a ring, which is fitted with a brake drum. Similar adjacent drums are connected to the internally-toothed gear ring, and to the driven shaft. The latter is not a portion of the gearset, but is the service brake. The other two brake drums are fitted with bands. When the band on the first drum is contracted, and locks it, the outer gear-ring is caused to revolve in the opposite direction from the inner gear pinion. When the second drum is locked, and the other released, the small planetary pinions travel around within the gearing, as turned, by the inner pinion, and is turned at a reduction of speed to that of the inner pinion. This gives low gear. High gear is obtained by clutching the driven shaft direct to the driving shaft so that the planetary gearset revolves about the shafts, as a flywheel, with the planetary pinions stationary.

2—This was explained in Motor Age in the issue of October 31, 1912.

#### HOW ELECTRIC HORNS WORK

Plattville, Wis.—Editor Motor Age—I would like to know the principle upon which the electric horns used on motor cars works.—Inquirer.

There are three principal types of horns, all of which operate on different principles. The first of these is of the siren variety, a rapidly revolving drum having apertures producing a sound, which is projected through an amplifying horn. The third type is mechanical in its action, consisting of a cam wheel, which is cut with teeth, and a button, secured to the center of a diaphragm, which bears on the cam. As the cam is revolved, it causes the diaphragm to vibrate, producing a sound which is projected through a horn. The cam wheel is turned by an electric motor. The fourth type is of the buzzer type, consisting of an arrangement of electromagnets, which vibrate an armature or pole-piece, which is in turn connected to a diaphragm. The vibration of the pole-piece of armature, causes the diaphragm to vibrate, producing a sound which is amplified by a horn.

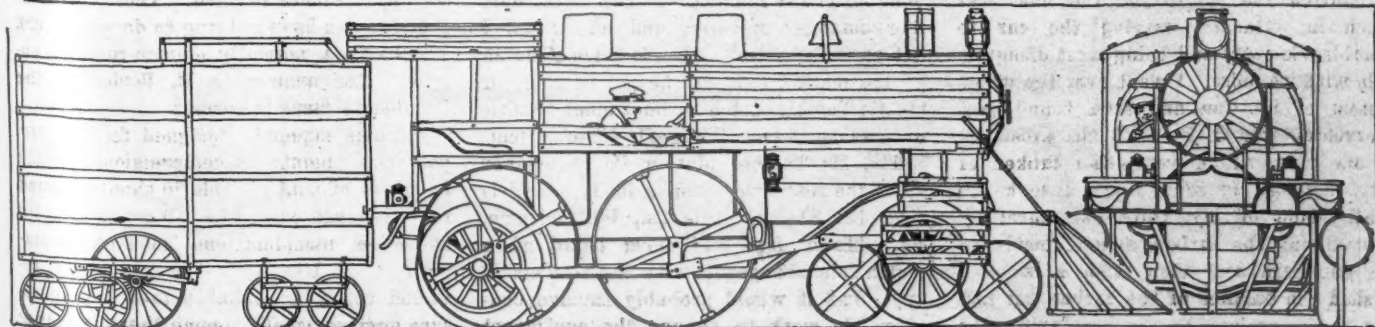


FIG. 4—DIAGRAM OF FRAMEWORK FOR FLORAL DECORATION OF NATIONAL CAR, SHOWING POSITION OF DRIVER

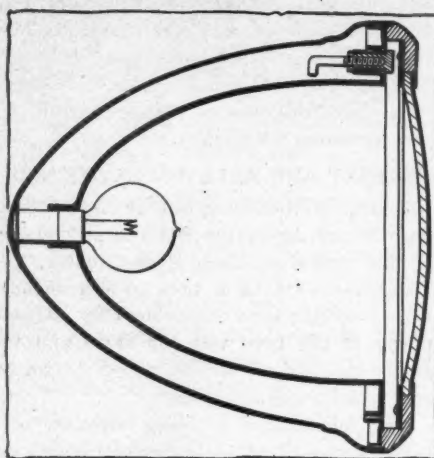
# Current Motor Car Patents

**Anti-Rebound Spring**—No. 1,044,661—To Nils W. Kaunitz, Hoquiam, Wash. Filed December 9, 1911, dated November 19, 1912. To prevent shocks and breakage of springs, this device consists of an addition to an ordinary leaf vehicle spring, consisting of a short leaf spring, secured on the inner portion of the spring curve; with its leaves built up in the opposite direction from those on the main spring. The smaller spring is secured to the main spring at its center, and is shackled at its ends to clips over the main spring. In action, the compression of the main spring is unrestricted by the auxiliary spring, but upon its recoil the smaller spring is flexed, excessive recoil being prevented by the extreme compression of the smaller spring being reached before such recoil can be reached by the main spring.

The rebound of the usual spring is unrestricted save by the weight of the car upon it, so that upon overcoming the inertia of the suspended mass, it is caused to rebound more than natural, oftentimes, by the exertion of the momentum of the rising body.

**Blood Universal Joint**—No. 1,044,734—To Clarence C., Howard E., and Maurice E. Blood. Filed January 25, 1912, dated November 19, 1912. This universal consists of a cup, secured to one shaft, and provided with two longitudinally curved channels, in which a pair of keys are movably disposed. These keys are curved to correspond with the curve of the channels in which they are situated, these curves being segments of a complete circle. The keys are thus allowed a limited movement on the center of this circle, but resist all end thrust or torsion, so that longitudinally and laterally they are as one. These keys are provided with bearings, in which are disposed pins secured to the complementary shaft.

**Twombly Lubrication System**—No. 1,044,709—To Willard Irving Twombly, New York, assignor to Twombly Motors Co., New York. Filed March 6, 1911, dated November 19, 1912. In a circulating-



HALL ADJUSTABLE HEADLIGHT

splash system of lubrication of gas engines, this device consists of a plunger-pump in the base of the engine, between the oil reservoir and the crankcase, provided with an inlet at the bottom and outlets at the top, provided with suitable check-valves. The plunger is operated by an eccentric on the crankshaft. The outlet is in the form of ducts leading to the camshaft, above the crankshaft, the oil overflowing from thence collecting in the crankcase for splash, eventually draining to the reservoir again.

This is little different from the circulating splash systems used on many four-cylinder vertical motors, its chief item of note being that it is adapted to two-cylinder horizontal opposed engines.

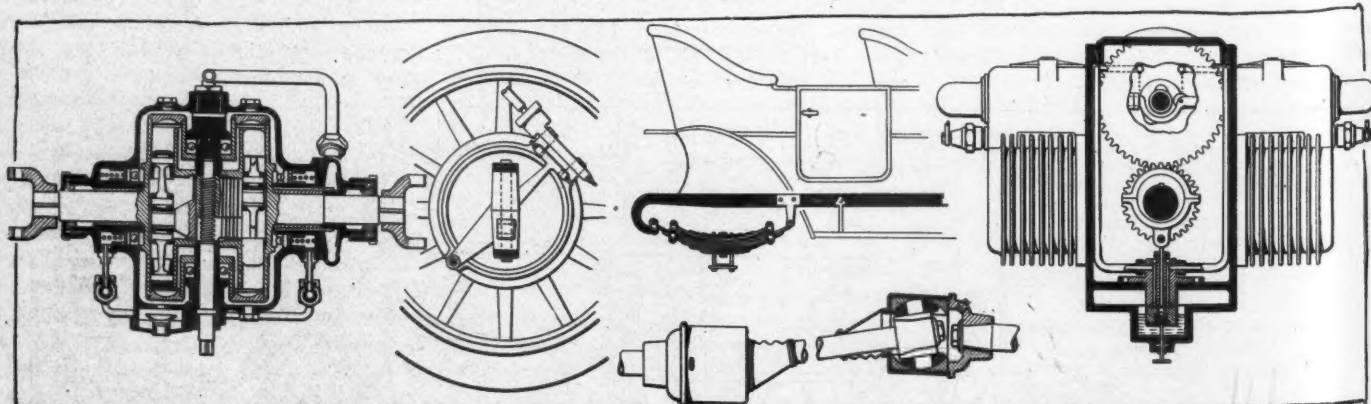
**Hydraulic Change-Speed Gear**—No. 1,044,846—To Marius Barbarou, St. Denis, France, assignor to Societe Anonyme des Automobiles Delaunay-Belleville, St. Denis, France. Filed December 8, 1910, dated November 19, 1912. This patent relates to a hydraulic transmission, comprising a pump and motor, interposed in the drive of a motor vehicle. The pump and motor are in the form of a series of radial cylinders, integral with the revolving case of the device, separated by a distributor plate. Each cylinder is provided

with a piston, which is connected to a common crank. The driving shaft operates one crank, and the driven shaft is operated by the other. The fluid is pumped from the exhaust of the motor by the pump to the distributor, where it is transmitted to the various cylinders of the motor, operating the pistons to turn the driven shaft. The distributor plate is held in contact with the other members by means of two thrust chambers, whose pressure is maintained by the internal pressure of the fluid.

**Hydraulic Brake Control**—No. 1,044,898—To Alexander Grant McGregor, Salt Lake City, Utah. Filed June 14, 1910, dated November 19, 1912. This device, for the purpose of controlling front wheel brakes, consists of a piston and cylinder, associated with a brake, and operated by fluid pressure from an external source.

A control is shown in the drawing, consisting of a screw-operated valve situated between the motor and the pump, adjacent to the distributor-plate, which allows a leakage of fluid through a bi-pass from the pressure side of the pump back to the suction side, without passing through the motor.

**Adjustable Electric Headlight**—No. 1,043,791—To William F. Anklaam, Detroit, Mich., assignor to C. M. Hall Lamp Co., Detroit, Mich. Filed March 16, 1912, dated November 12, 1912. To enable the user to adjust his reflector for different requirements, this lamp design consists of a parabolic reflector within a sheet-metal casing. To this casing is secured the lens, and at the back a pillar supporting a lamp socket. The reflector slides on this pillar and on a bearing near the door of the lamp. A screw and nut, secured to this bearing is adapted to be turned, moving the reflector back or forward, to adjust its focus with the stationary lamp. The adjustment enables the light to be changed at will from a wide, flaring, funnel-shaped beam, to a narrow, pencil-shaped one for country work.



DELAUNAY-BELLEVILLE TRANSMISSION

KAUNITZ ANTI-REBOUND SPRING  
McGREGOR BRAKE

TWOMBLY LUBRICATING SYSTEM  
BLOOD UNIVERSAL JOINT



# The Motor Car Repair Shop

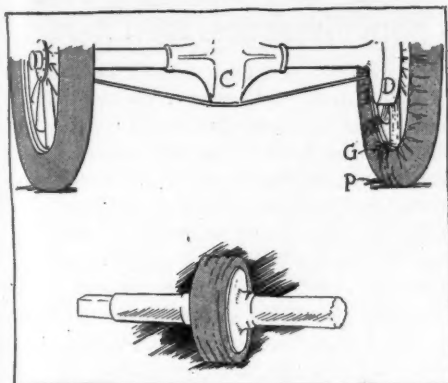


FIG. 1—CURING LEAKY AXLE

## Handy Torch Support

**P**ORTABLE gas torches suitable for brazing, etc., are to be found in many repair shops throughout the country; whilst there are many shops that need them but have them not. For the benefit of those who have or contemplate equipping themselves with these useful articles for the repair shop, the torch and stand shown in Fig. 2 are offered, with the belief that they will be found satisfactory.

Both the stand and the torch are of homemade construction and in constant use in one of the greatest motor car repairshops in the world. This equipment is particularly useful in performing repairs on motor car frames and the like. The stand possesses several unique features. It is of very light but substantial construction which makes it readily transportable about the shop; the top plate has three notches of various depths that serve to hold the torch at different angles; these notches together with the means to secure the clip to the stand facilitate the adjustment of the torch to almost any desired height or angle; and the clamp-pivot which grips the torch, can be readily lifted out of the top plate of the stand when it is desired to hold the torch in the hands.

The constructional details of this outfit are quite clearly shown in the illustration. The top plate and base ring of the stand are made of sheet iron  $\frac{1}{4}$ -inch thick, and an old motor valve-guide may be employed to support the pivot pin of the torch bracket whose features are more clearly shown in the mechanical sketches at the right in the illustration. The vertical supports of the stand, are made from  $\frac{1}{4}$ -inch iron gas-piping, each support being threaded at its ends and screwed into both the top plate and base ring at the same time. The torch bracket is a forging made in the blacksmith shop; it might be made from any suitable piece of flat iron, however, without the use of a blacksmith's forge. The torch is made from

## Hints for the Amateur

brass tubing and of ordinary blow-pipe construction.

This is an idea that may be seen in foreign workshops. Those who have tried it speak most highly of its efficiency. It is easily made and at the same time is inexpensive. Its utility, however, is in much greater proportion than its cost or the trouble of making it, say those who have tried it.

### Testing Brakes for Winter Use

The time of the year has come when the motorist is considering the removal of the open body and replacing it with a closed one. One very important factor should be borne in mind, if an inclosed body is to be set on the chassis, and that is, brake adjustment.

Since the enclosed body weighs much more than the open one, it is evident that serious trouble will result should the brakes be neglected. Just before the car with the winter body is ready for actual use the brakes should be thoroughly tested. The car should be run at the rate of 25 miles an hour and the brakes suddenly jammed on. It should be noted whether or not the rear wheels slide, that is, if they grip the ground firmly, at the same time. One wheel should not slide before the other and both should hold the pavement at the same time the brake pedal is thrown.

Neglecting to readjust the brakes, especially in the case of cars with heavy limousine bodies, invariably causes rear-end collisions, the brakes not being able to resist the momentum of the now greater weight.

### When Grease Leaks From Axle

In the upper section of Fig. 1, is shown rather a common cause of grease on floors, streets and tires. Oil has leaked out of the rear axle of a motor car and been thrown out of the brake drum D onto the spokes and tires of the wheels; and having been left standing for a while, a portion of that which was contained in the drum D has run down the spokes of the wheels and formed pools P around the tire's area of contact with the floor. This most undesirable condition is brought about in two ways; either the differential case C has been packed too full, or the felt washers placed at the end of the axles for the purpose of preventing leakage of oil therefrom have become worn down. The remedy in the first case is to remove some of the lubricant or perhaps use a heavier grade of oil, and in the second case to have new felt washers fitted in the axle ends.

In London, England, there was a time when the taxicabs and motor omnibuses of the city distributed so much oil about the streets in this way that a clause was included in the police regulations governing motor car traffic which required that every taxicab and other motor vehicle be fitted with means of preventing the leakage of oil from their mechanisms; and in the lower portion of Fig. 1 is shown the means employed by one of the great taxicab companies to eliminate the loss of oil from the rear axle, a remedy, by the way, which not only is a great benefit to all users of the streets, but which has saved the company many dollars worth of oil and tires. The means consist of a simple method of fitting several felt washers onto the driving shafts of the rear axle so that the oil from the differential case can not pass into the wheel hubs in such quantities as to leak therefrom. These felt washers are held between two brass flanged collars which are soldered or sweated onto the drive shafts as indicated.

Aside from the dirty and disagreeable appearance of the car, caused by the leakage of oil from a rear axle, and the extra labor required in washing the car, it is a well known fact that grease and oil have a most detrimental effect upon rubber such as is used on the treads of tires. It tends to soften this rubber and make it soggy, and when a car is run with a tire in this condition the rubber is not only easily worn off, but it also can be readily loosened from the fabric; then the cement used to secure the rubber to the fabric dries and crumples, and forms what is generally known as sand blisters.

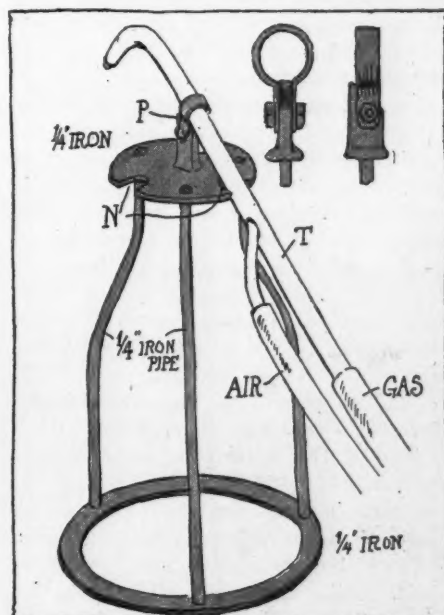
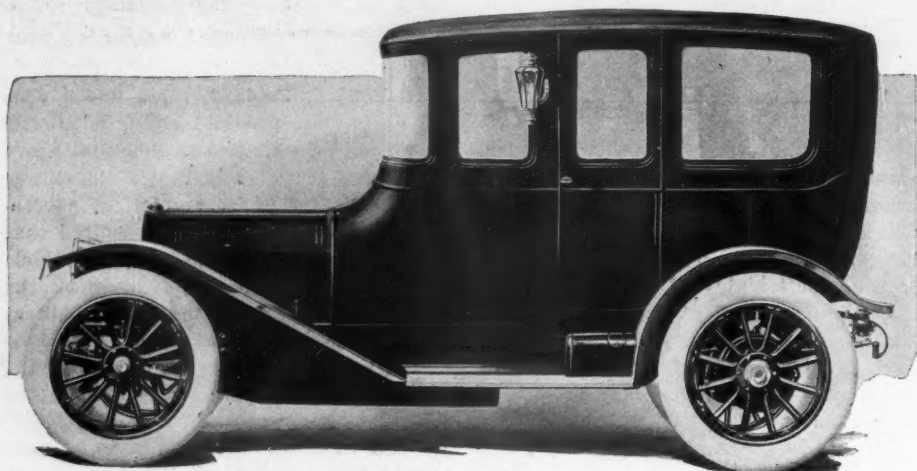


FIG. 2—SUPPORT FOR BLOW-TORCH

# Kisselkar Carries Over Four Models



KISSEL COUPE WITH STREAM-LINE FRONT

**K**ISSELKAR products in the pleasure car field for 1913 include the same four chassis models as those which comprised the line for this year. There have been comparatively great changes in dimensions of some features but no radical alterations in design. As for the present season, next season's offering embraces three four-cylinder models of 30, 40 and 50 horsepower respectively, and one six-cylinder model of 60 catalog horsepower. Touring, semi-touring, runabout, semi-racing, limousine and coupe bodies are supplied on all chassis models.

All four Kissel chassis are alike in their general design; they have the same type of L-head motor with the cylinders cast in pairs, all have the silent chain camshaft drive, and same type of circulating oiling system, and are fitted with Stromberg carbureters. All models use the leather-faced cone clutch, floating rear axles, with a heavy torque rod to the central frame member. The side members of the frame are narrowed or bottle-necked at the dash, and have the double drop. Three-quarter elliptic rear springs are also a feature of these products.

## Kisselkar Changes

Principal changes in the 1913 Kisselkar include the addition of an electric starting and lighting system, a new detail of piston construction by which smoking is practically eliminated and waste of lubricating oil checked, longer wheelbase on the three larger models, increase in stroke of the 40 from 4 $\frac{1}{4}$  to 5 $\frac{1}{2}$  inches larger valves and more easily operated clutch release pedals. The lengthened wheelbase was adopted to give increased ease of riding and to permit the more roomy and comfortable seating arrangements which distinguish the Kisselkars of this year. The use of the four-speed gearset has been made more general in the Kisselkar chassis than heretofore. This year only the two larger models provided four speeds, while next year all except the very smallest model will have the four-

speed gearset. The fourth speed is geared up and the direct drive is on the third speed. The gearset shafts are mounted on F. & S. ball bearings.

With the exception of the smallest motor there is shown the leaning toward an excess of stroke over the bore as evidenced by the cylinder dimensions in the following summary:

Model	Bore inches	Stroke inches	Wheelbase inches
30	4 $\frac{1}{4}$	4 $\frac{1}{4}$	116
40	4 $\frac{1}{2}$	5 $\frac{1}{4}$	121
50	4 $\frac{3}{4}$	5	132
60-six	4 $\frac{1}{2}$	5 $\frac{1}{2}$	140

A novel refinement in the oiling system for this year is the method by which smoking is prevented. The lower edge of the bottom ring groove in the piston is bevelled off and eight holes drilled at right angles to this groove through the piston casting. Any surplus oil is scraped off the cylinder wall by the bottom ring and carried to the inside of the piston by these eight holes, and thus finds its way

## Electric Motor-Starter and Longer Wheelbase Among the Features for 1913

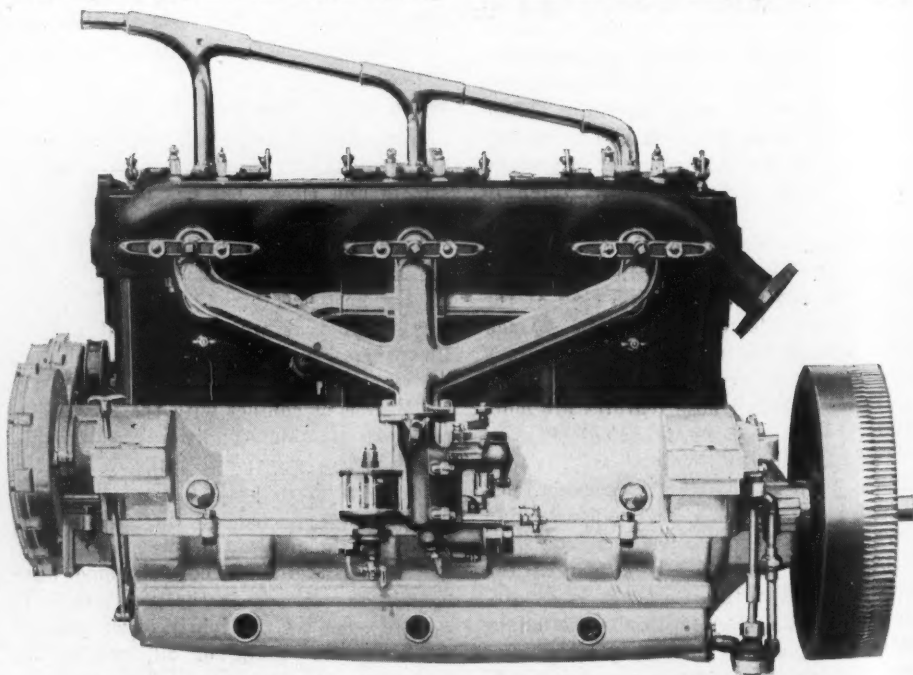
back to the crankcase instead of getting past the rings into the explosion chamber. This is illustrated at H in one of the sketches on the opposite page.

### The Oiling System

The oiling system is a circulating one with the gear pump located at the left rear of the crankcase and driven through a vertical shaft from the camshaft. This oil pump draws its supply from a sump in the lower part of the crankcase and forces it through a pipe carried in the upper part of the case. This pipe has four outlets, one opposite each connecting rod lower end so that the oil is forced directly upon them. A splash level beneath the connecting rods cares for lubrication of the crankshaft, camshaft and wrist-pin bearings and the cylinder walls and pistons. When the splash level exceeds a certain height it overflows and returns to the sump, where it is passed through wire mesh to the pump. A handle which may be seen at the front of the motor opens the drain cocks in the bottom of the case, so that it is unnecessary to reach under the motor.

### Six-Cylinder Features

The general features of the Kissel motors are illustrated in the view of the six-cylinder motors reproduced in these pages, showing the method of inclosing the valve springs and the clean appearance resulting. The crankcase is a two-part aluminum casting, the upper half of which carries the four crankshaft bearings used on the six and the three bearings of the four-



LEFT SIDE OF KISSEL SIX MOTOR SHOWING TOOTHED FLYWHEEL

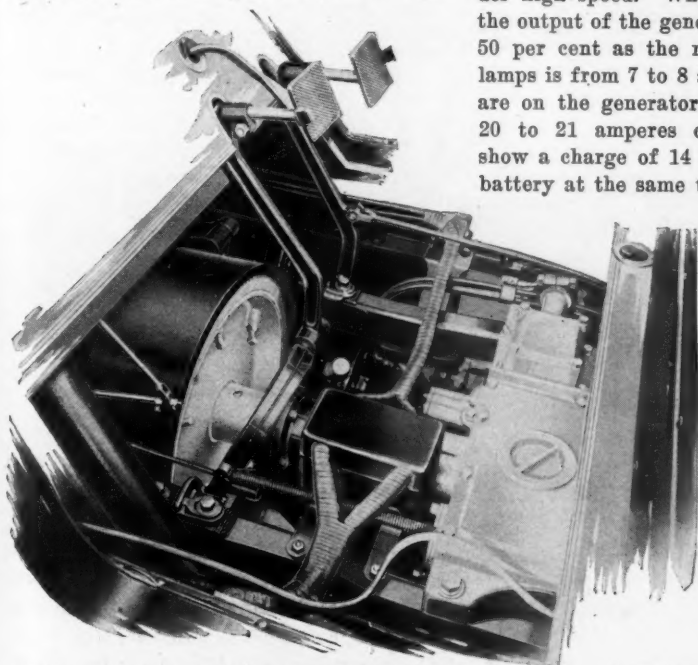


cylinder motors. Four integral arms on the upper half of the case supply the four-point support for the motors. Cylinders, wrist pins, crankshaft bearings, etc., are ground to size and after the cylinders have been ground they are lapped in a special grinding machine. Each piston is then lapped in its respective cylinder and the piston rings in the grooves in which they are to work.

Motor and gearset are carried on sub-frame members, the gearset being amidship of the frame. Transmission of power from the gearset to the rear axle is through a propeller shaft with two universal joints, one at the front end and the other at the rear. At the left of the shaft is the torsion tube.

#### Floating Rear Axles Used

Kissel rear axles are of the floating design and are shown in one of the illustrations. The axle tubes are tapered from the differential housing to the rear wheels.



TRANSMISSION DETAILS OF KISSEL WITH ENGINE STARTING ARRANGEMENTS

Extra strength of the housing is obtained by means of a webbing or reinforcing. The bevel-gear type of differential, employed for the first time this year, is continued in next year's cars. This differential is carried on Timken roller bearings and an adjusting ring is supplied by which the bevel pinion can be moved into adjustment with the differential bevel. Also the differential unit can be moved side-wise to mesh properly with the pinion.

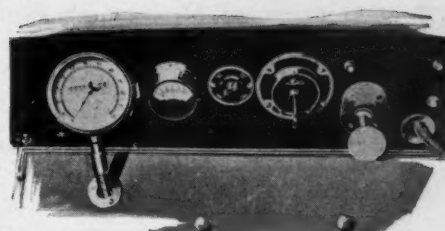
Kissel running gears have the double drop frame as formerly and frames are bottle-necked at the dash to make turning easy. Springs are semi-elliptic in front and three-quarter elliptic in the rear.

The starting and lighting system is in two units. The current is produced by an Esterline 6-volt generator from which it is sent to a storage battery through a control box containing a fuse panel and the cutover switch, the latter cutting the generator into the circuit as soon as its

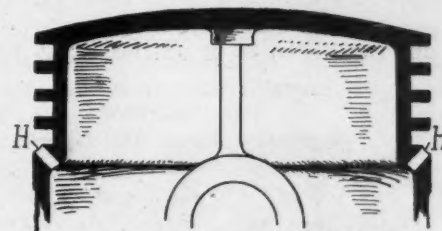
voltage is greater than that of the battery and cutting out the generator when it falls below the battery pressure. The fuse panel contains a fuse each for the head, side, tail and instrument lights. When either the head or side lights are in use the taillamp also is lighted to conform with most state laws demanding that the taillamp be lighted when other lamps are lit. All wires are enclosed in conduits to prevent chafing and consequent short circuits and an ammeter is used on the dash to show the rate of current flow at all times.

A valuable feature of the generator is that when no current is being used the output cannot exceed 14 amperes, regardless of the engine or car speed. This is obtained without the use of any magnet control switch cutting in a resistance coil so that there is no liability of burning contacts or burning out the generator under high speed. When the lights are on, the output of the generator increases about 50 per cent as the normal current of all lamps is from 7 to 8 amperes. When lamps are on the generator output will be from 20 to 21 amperes or the ammeter will show a charge of 14 amperes going to the battery at the same time furnishing 7 amperes for lights. The battery is really two six-volt units in one case and is charged in parallel.

The starter motor is a series wound, enclosed type and has an enclosed gear reduction with a pinion sliding on a countershaft and meshing with teeth cut in the rim of the engine flywheel. This gear reduction is designed so that the sliding gear meshes easily with the teeth in the flywheel so that it will not fail to engage when the starting plunger is pushed in for starting. This starting plunger is simply a foot pedal and is so connected that the simple act of pushing it with the foot



DASH OF 1913 KISSEL



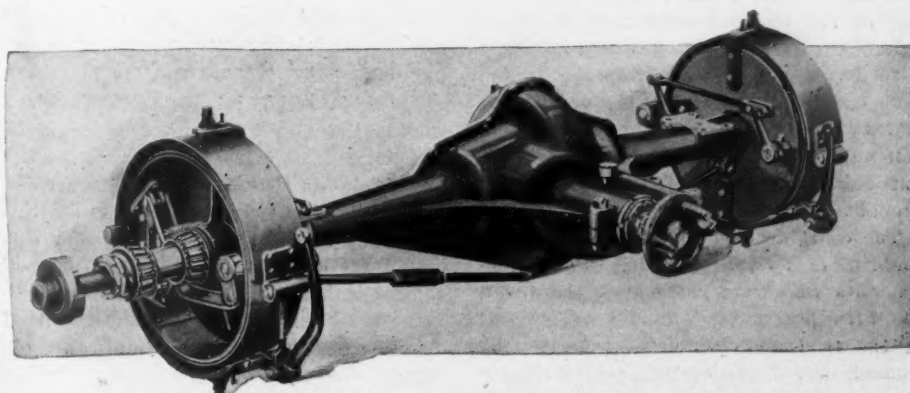
OIL HOLES, H, IN KISSEL PISTONS TO PREVENT SMOKING

changes the battery leads on the controlling switch so that the two units of the battery are thrown in series and supply a 12-volt current to start the motor. At the same time pushing in the plunger closes the switch to the starter and slides the motor pinion into mesh with the teeth on the flywheel. The only operation other than pushing in the pedal required for starting is to retard the spark. When the engine starts and the plunger is released, the slide gear disengages from the flywheel, but there is in addition an automatic clutch in the reduction gear that releases the starter motor armature as soon as the sliding gear is driven faster by the flywheel than the starter motor turns it.

#### Changes in Body Details

There have been some decided changes in the body details of the Kisselkar line for 1913. The tonneau of each model has been enlarged and altered to incorporate an adaptation of the French commodite design. This consists in the use of very strong springs in the seat and back covered with 11 inches depth of upholstery. The seats are extra low and unusually wide. The lowness is believed to modify the side sway when traveling at high speed and turning corners, while the extra width enables the occupant of the tonneau to assume a semi-reclining position if so desired.

Complete equipment is one of the features of Kisselkar production. The equipment includes mohair top and top cover,



DETAILS OF THE FLOATING REAR AXLE ON KISSEL CARS

windshield, electric lamps, shock absorbers and extra demountable rim besides electric horn and the regular outfit of tools and tire repair supplies. The dash lights and tail lamps are combination of oil and electric and an option is offered of either black enameled or nickel plated finish on the lamps.

Tires are all demountable and are the same size, front and rear. Those on the 30 horsepower chassis are 34 by 4 inches in size; on the 40, 35 by 4½ inches; 36 by

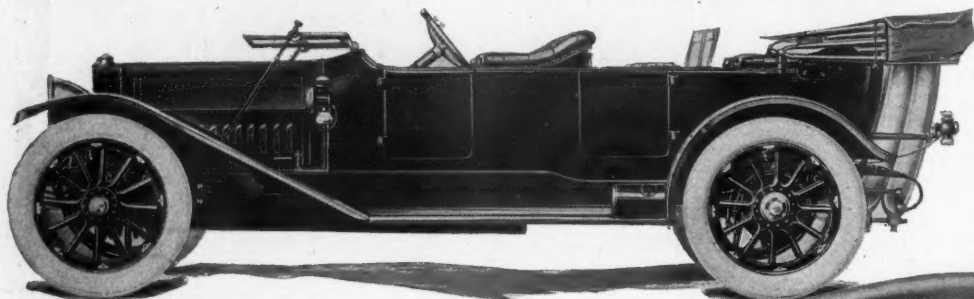


#### Theory and Practice of Lubrication

FROM the standpoint of both the engineer and chemist, the subject of lubrication has been added to the list of avail-

mediately applicable to the requirements of the designer.

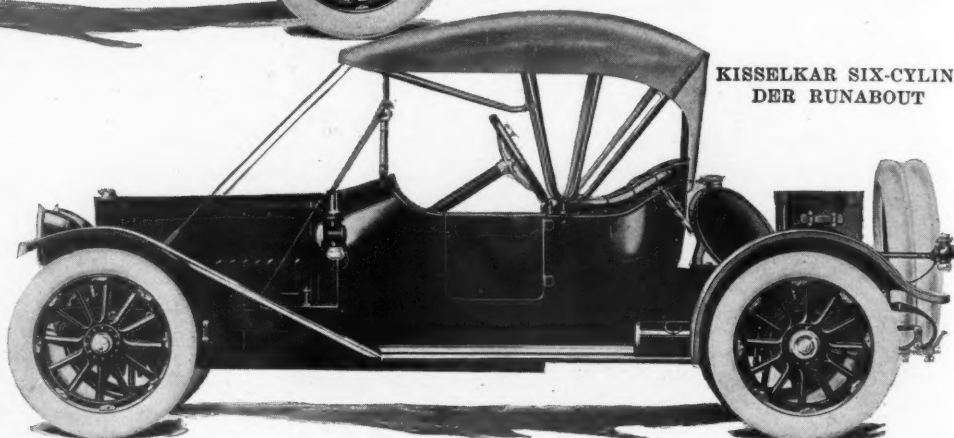
The present edition is the third, and has been brought up to date, and considerably amplified in the two revisions. One of these editions has been translated into the French language. The scope has been somewhat amplified. The theories of friction of solids; internal friction, or viscosity of liquids; plastic friction; superficial tension of fluids; and the theory of lubrication are covered as a groundwork, the more practical phases being covered by chapters on the sources, preparation and chemical and physical properties of lubricants; methods of testing and examination of lubricants; and mechanical methods and appliances of testing oils, greases and graphites. Theory being thus disposed of, its application is explained



KISSELKAR SIX-CYLINDER SEVEN-PASSENGER TOURING CAR

4½ inches on the 50; and 37 by 5 inches on the six-cylinder car. In the two larger chassis either fore-door or open-front limousine bodies are offered, the prices on which include regular touring bodies which are interchangeable with the limousine body.

Special attention seems to have been paid to the disposition of the spare tires. The two illustrations on this page show how they are carried at the rear of the body.



KISSELKAR SIX-CYLINDER RUNABOUT

#### JOY RIDING PRECEDENT ESTABLISHED

Milwaukee, Wis., Nov. 25—A point of law was established in a case tried at Milwaukee last week which will make it possible to collect damages from the persons or person responsible for taking a car without the owners' consent for joy-riding or other purposes. The W. E. Allen Co., state agent for the McFarlan and Marathon, brought suit against Robert Leonard and five others for damages due to the misuse of a car.

Leonard was employed in the Allen garage and took out a touring car, a demonstrator, invited five friends to go riding, and in the early hours of the next morning landed the car against a telephone pole. Allen's attorneys proceeded against both driver and passengers on the ground that concerted use was made of the car and that all were guilty of conversion. Not only was claim made for repair cost, but for depreciation of the car's value brought about by such repairs.

The court decided that the driver alone could be held liable, excusing the four defendants who were passengers. However, the fifth passenger, who did not appear at the trial and was not represented by counsel, was held jointly responsible for this error or omission, with the driver. Judgment was rendered against both.

able technical literature under the joint authorship of Leonard Archbutt and R. Mountford Deeley. The chief value of this work as distinct from many other treatises on the same subject arises from this joint viewpoint. The practical machine designer is confronted with problems in the design of bearings that are neither purely mechanical nor purely chemical.

Without such a work as "Lubrication and Lubricants," he is forced to resort to the study of a number of works, each of different scope, in order to secure the theory and data pertaining to all phases of his problem. It remains for the individual designer to supply the proper correlation between the differing aspects of the general subject of the reduction of mechanical friction by the combination of chemical, physical and mechanical means.

To obviate this intense research which would otherwise be required of each designer, with the inevitable irregularities and mistakes that must result from the necessarily hurried study of each, this work has been prepared in collaboration by a practical chemist and a mechanical engineer. The result is an elaborated digest of the subject, that is the result of exhaustive research and experiment, obviously deeper, broader, and more painstaking than is possible for the individual engineer to afford himself, in a form im-

in succeeding chapters on the design and lubrication of bearings and friction surfaces, the lubrication of machinery, and the lubricative hygiene of machinery.

The work is of painstaking depth and thoroughness, but is at the same time presented in a rational, well-composed manner of diction, that adapts it to the use of any of ordinary training. The volume contains 568 pages of matter, exclusive of indexes, a large part of which space is devoted to a valuable and comprehensive set of tables, diagrams and graphs, for quick calculation, that, while presented as an integral part of the text, is conveniently indexed and listed for reference. J. B. Lippincott, Philadelphia, is the publisher. The book is illustrated.

#### London's Motor Roads

Appearing first in 1906, and a second edition in 1907, "Motor Roads to London" has now been revised and enlarged until the book contains almost every available motor road in Great Britain. It is printed in good clear type, bound in handy form with waterproof cover, and contains a very easily followed map of the main roads leading out of London. There is also given general information regarding registration, international touring, etc., affecting motor cars. Published by the Mitchell Motor Works and Garage, 114 Wardour street, London, W., England.



# No Radical Changes in Reo the Fifth

**REO**, the Fifth, the single chassis model in which the product of the Reo factory is offered, appears for 1913 with very little change from its 1912 form. What alterations there are occur in the bodies and increased size of tires. There are no changes of any note in mechanical features of the car.

This model, which was offered to the public early in 1912, was distinctive in the use of left-hand drive and center control. Its general specifications as continued for 1913 season include a four-cylinder motor with cylinders 4 by 4½ inches bore and stroke with the inlet valves in the head of the cylinder and the exhaust valves in a pocket on the side. The motor is cooled by water circulated by a centrifugal pump and a radiator through which a one-piece fan located behind it provides circulation of air. Ignition is by dual system using a National magneto with storage battery as an auxiliary. A Holley carbureter is employed and a double heating of the intake air is supplied by exhaust hood and hot-water jacket. The motor is very accessible throughout, the adjustments for the connecting rods being reached through hand holes in the crankcase, and main bearing adjustments can be made on the outside without opening or dismantling the motor.

## Reo Transmission

In the transmission gearset the main-shaft is mounted on Timkin bearings and the countershaft on Hyatt bearings. The

## Bodies Altered Some for 1913—Larger Tires Are Fitted

brakes, therefore, are operated by the feet and can be applied whenever necessary without taking the hands from the steering wheel. Both pedals are fitted with ratchets which permits of their being locked independently or both at once. The brakes are operated through cables instead of by rods as is the more usual practice. This does away with the rattle sometimes caused by loose brake rods.

## Torsion Tube Eliminated

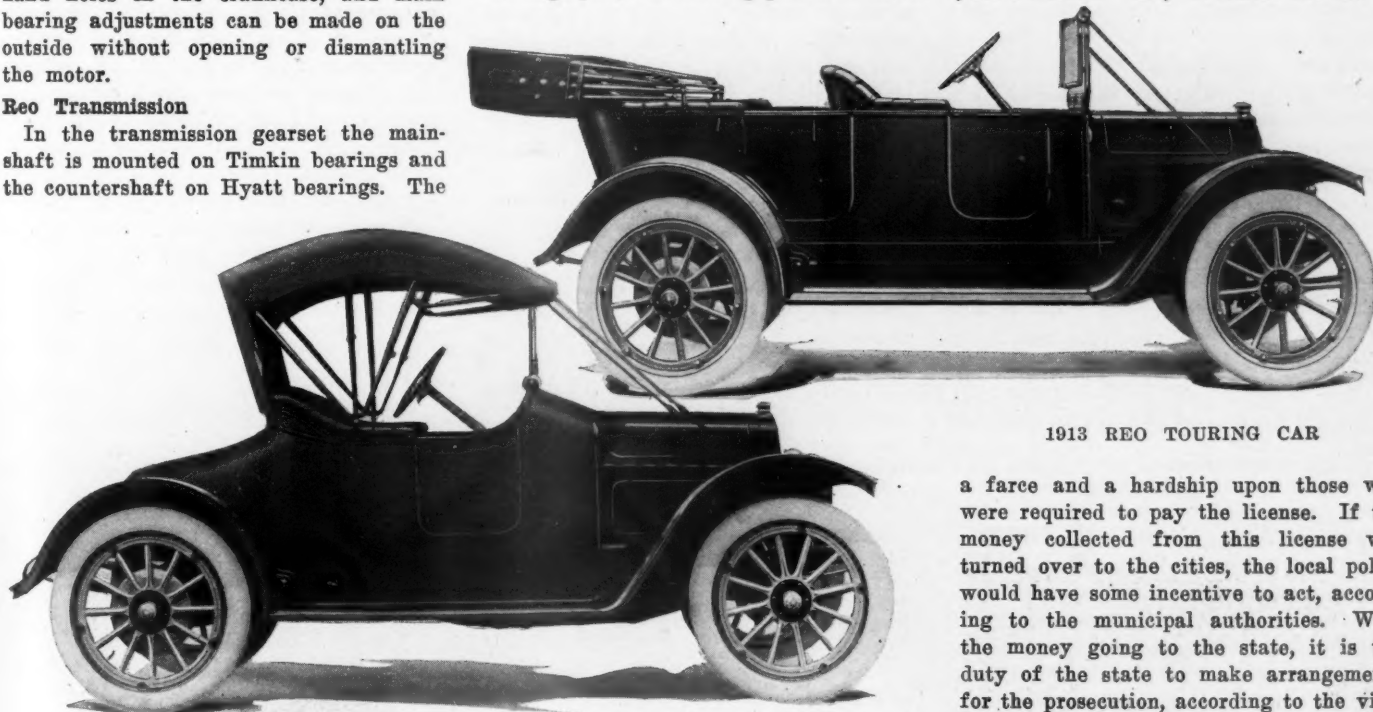
An important change in the transmission mechanism which was made this year and is continued for 1913, is the elimination of the torsion tube which formerly inclosed the propeller shaft and the adoption in its place of an exposed propeller shaft with two universal drums. The rear axle is continued in its present form, the shafts being of nickel steel; the differential gear having four pinions. Timken bearings are used throughout except next to the wheels, where Hyatt roller bearings are employed; the driving pinion is made

Upon this single chassis there will be fitted three bodies, a two-passenger roadster, a five-passenger touring car and a six-passenger limousine. The bodies are of fore-door, straight-line type and the effort has been to give them a clean cut appearance. The equipment of the touring car and roadster types includes gas headlights, electric gas lamps and combination electric and oil taillight and storage battery in addition to the usual equipment.

## ILLINOIS CHAUFFEURS REBELLING

Bloomington, Ill., Nov. 23—Chauffeurs of Central Illinois will unitedly resist payment of the annual tax for license and the examination by the state examiners. They declare such a license is illegal and unconstitutional and that no effort was made to prosecute those who declined to take the test and pay the license fee.

Asserting that fully one-third of the chauffeurs of central Illinois were unlicensed and drove cars without restraint during the year now closing, the drivers who did take the examination and paid the fee, now insist that they will not pay next year's license. They denounce the law as



1913 REO TOURING CAR

REO THE FIFTH TWO-PASSENGER ROADSTER

gearset is of the selective type and provides three speeds forward. The gearshift lever is located in the center of the forward compartment and is so designed that the top of the handle moves only three inches in going from low to high speed. The multiple-disk clutch operates in oil. The emergency brake lever is replaced next season, as this, by having the brake operated by the clutch pedal. Both

integral with the shaft and a great deal of attention has been given to securing quiet gears for this axle. Practically the only change in the chassis is in the size of the tires, which have been increased to 34 by 4 inches front and rear. The frame is of pressed steel in channel section and the springs are half-elliptic in front and three-quarter elliptic in the rear.

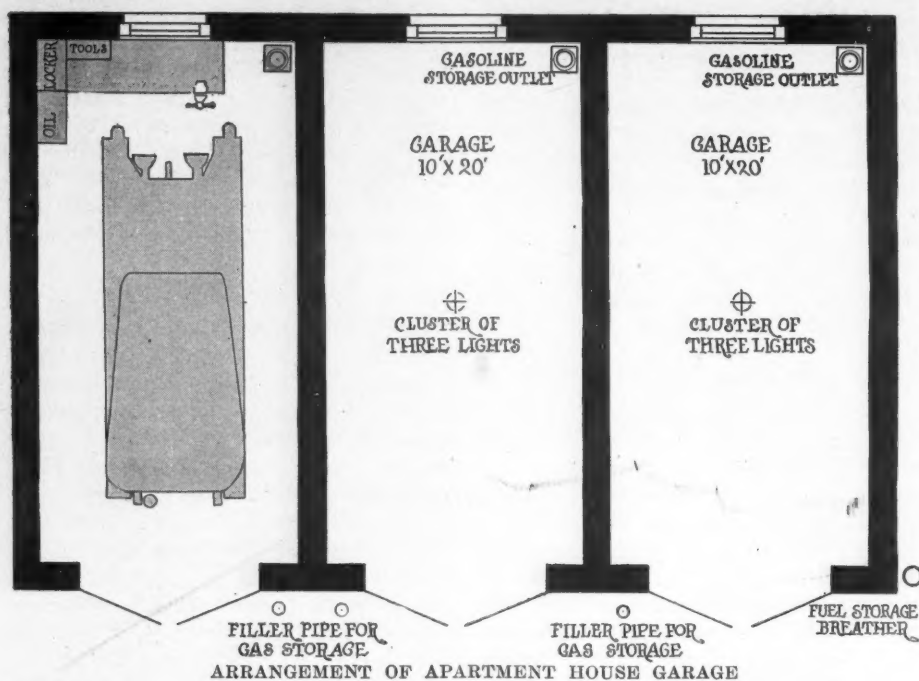
a farce and a hardship upon those who were required to pay the license. If the money collected from this license was turned over to the cities, the local police would have some incentive to act, according to the municipal authorities. With the money going to the state, it is the duty of the state to make arrangements for the prosecution, according to the view of the police departments.

In order to make the law of any value, it is vital that a portion of the fine for violation be paid to the officer making the arrest, according to the municipal authorities. Policemen who at first made an honest effort to enforce the law, say that they were unable to tell which driver carried a license and those without and, usually when they stopped a driver with the license, they were greeted with abuse for their error and officiousness.



# Housing the Motor Car

The Apartment House Garage



ONE of the drawbacks of city apartments from the viewpoint of the motorist flat-dweller in the city is the lack of accommodation for his car. The motorist is forced usually to patronize the public garage, which means inconvenience and expense. In order to cater to this class of tenant many owners of apartment buildings, particularly apartments of the better class, are erecting in connection with the flats, banks of small garages, one for each apartment.

A good example of this type of garage is that which recently has been erected in connection with two three-apartment buildings which have just been opened at Drexel boulevard and Fiftieth street, Chicago. At the rear of each apartment building is a bank of three one-car garages

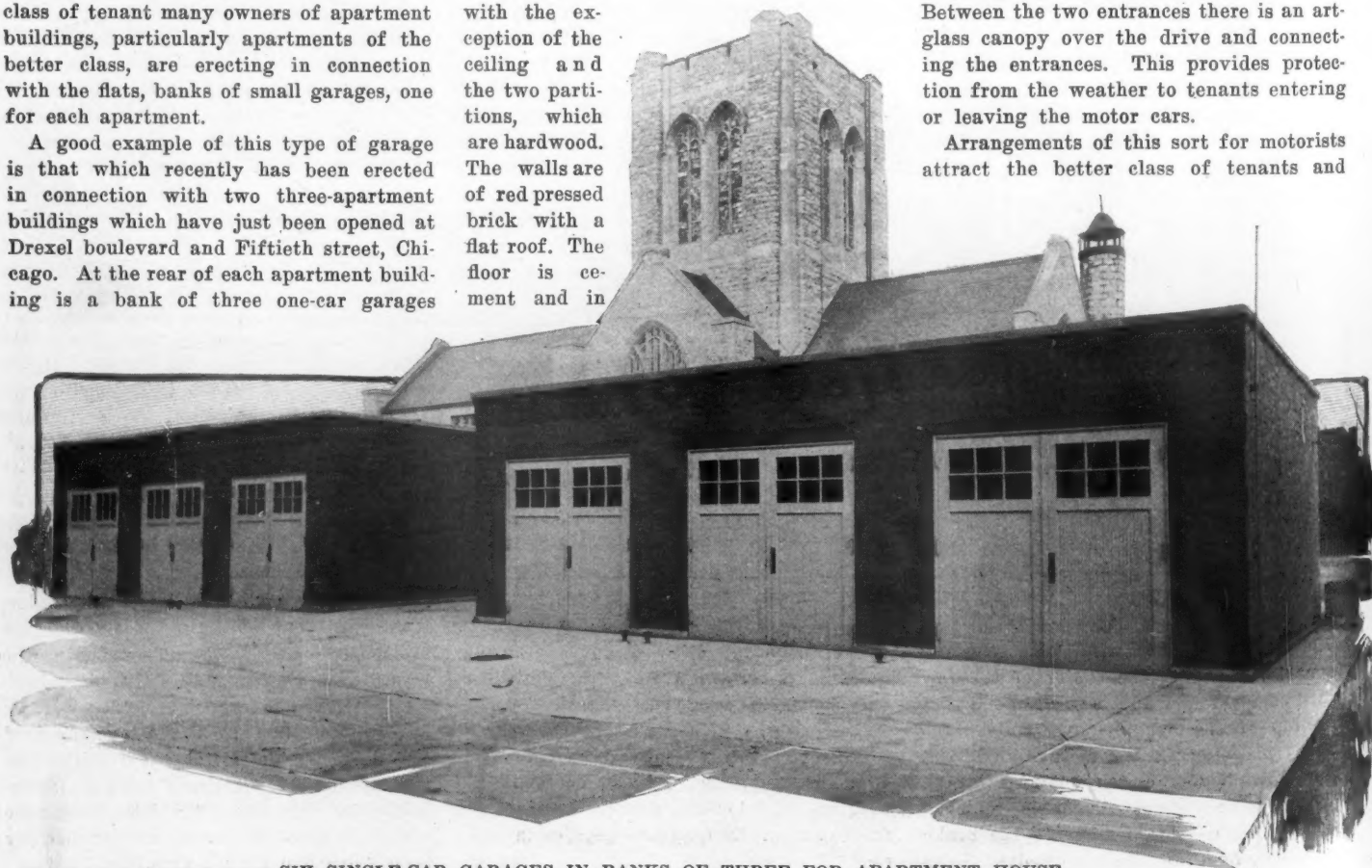
as shown in the illustration. The three form a single building about 32 by 12 feet in size, which is divided into three rooms by partitions. These rooms are only large enough for one car, being about 10 by 20 feet in size. The construction is fireproof throughout with the exception of the ceiling and the two partitions, which are hardwood. The walls are of red pressed brick with a flat roof. The floor is cement and in

the floor of each stall is a drain connecting with the sewers. A single window high up in the rear wall and the windows which form the upper third of the double folding doors afford sufficient illumination for daytime while a cluster of electric lamps in the ceiling give light at night. There is room at the end for a work bench and tool chests, as well as an oil cabinet, although these are not supplied with the garage.

Under the floor of each room is an underground gasoline storage tank, the outlet of which projects through the cement floor. Just outside of each room in the cement court the filler pipe protrudes. This is provided with a lock and each tenant thus has his own fuel supply. At one corner of the building rises the header, which acts as a breather to admit air to all of the fuel tanks as the gasoline is drawn off.

Quite a novel arrangement is employed in providing a driveway and entrance to the garage buildings. The two apartment buildings to which these two sets of garages are adjuncts are side by side with a space of about 10 feet between them. A cement drive from the street to the cement court in the rear is laid between the two flat buildings, with carriage entrances facing each other on the driveway. Between the two entrances there is an art-glass canopy over the drive and connecting the entrances. This provides protection from the weather to tenants entering or leaving the motor cars.

Arrangements of this sort for motorists attract the better class of tenants and



SIX SINGLE-CAR GARAGES IN BANKS OF THREE FOR APARTMENT HOUSE



increase the value of the property very materially at a slight increase of cost. These two banks of garages accommodating three cars each represented an expenditure of only \$1,800 each, including the lighting arrangements and the underground storage systems. Single garages of similar construction and equipment for one car probably could be put up for about \$1,000 or less.

#### PROPER CARE OF UNUSED BATTERIES

CLEVELAND, O.—Editor Motor Age—Many owners whose cars are equipped with storage batteries in connection with lighting, starting and ignition systems and who do not care to operate them during the cold months, will soon be storing them for the winter.

True, most owners operate their cars all the year around, but some, especially if they have open cars, store them. It is for the benefit of the latter class that this article has been prepared. It is believed a perusal of it would be of benefit to many.

Unless a storage battery is given proper preparation for its long period of inactivity, the owner, when he puts his car into service again in the spring, will find cause to regret his neglect. A storage battery is at its best when in constant service and no amount of intelligent use will cause it to deteriorate so rapidly as idleness unless prepared for it. A few words, therefore, upon the care of this very important but much abused accessory may save the reader the price of a new battery next spring.

Considering, first, cars equipped with starting and lighting devices operated from storage batteries. In order to maintain a storage battery at its proper efficiency it is necessary to give it a charge at certain intervals, therefore the owner

## Manufacturers' Communications

should so arrange that he can run his engine and charge his storage battery at least once every 2 weeks. It is unnecessary to run the engine for a long period of time, only just sufficient to bring the battery up to its full capacity.

Every car owner should provide himself with a specific gravity hydrometer, a device made of glass with a rubber bulb, which enables one to draw solution up from the cells to ascertain its strength or specific gravity. At intervals of 2 weeks the engine should be run until the gravity of the solution is up to 1.280 degrees as indicated by the hydrometer reading. If this is done regularly every 2 weeks, it will be necessary to run the engine only about an hour each time. If the owner does not possess a specific gravity hydrometer, the engine should be run 2 to 3 hours every 2 weeks for the sake of safety. However, it will be found much more economical and easier, as well as safer, to be guided by the accuracy of the hydrometer than to guess at the time necessary to operate the engine.

To charge the battery properly, the engine should be run at a speed equalling a car speed of 20 miles per hour. The method above suggested for cars equipped with generator or dynamo will be found all that is required and if carefully observed the owner may be sure that his battery will show no loss of efficiency when it is again put into regular service.

In some instances the owner may be obliged to store his car where it is impossible or very inconvenient to operate his engine as above directed. When this is

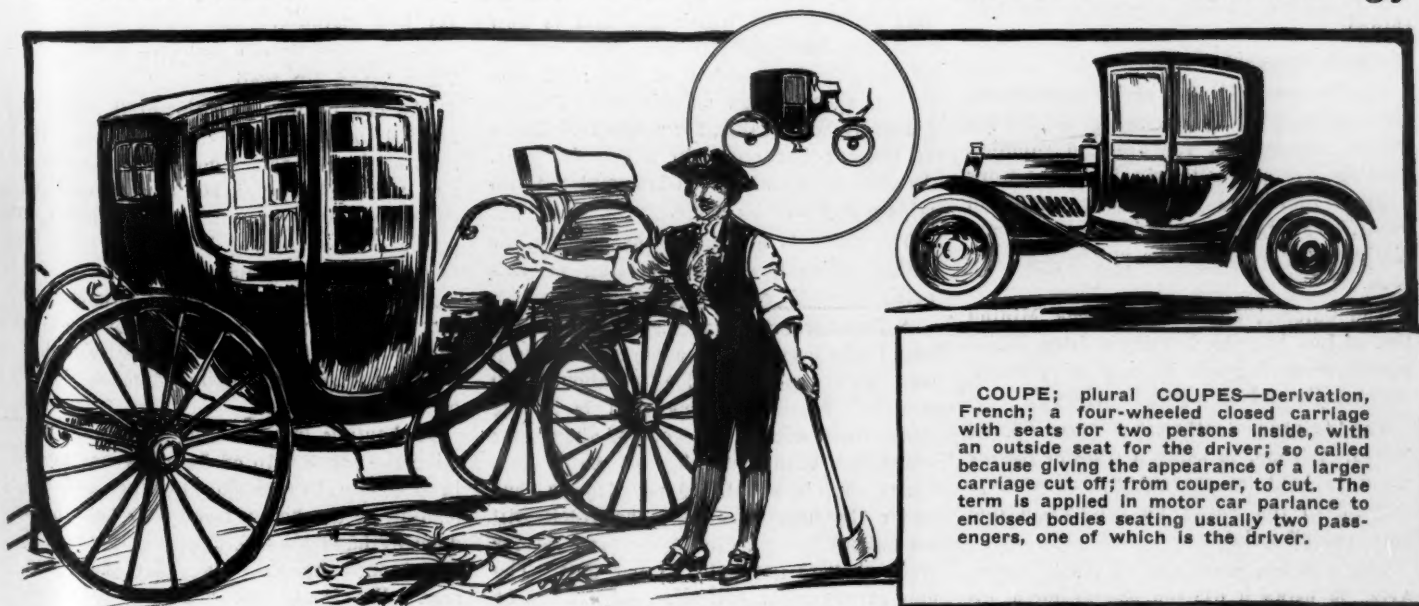
the case, it is recommended, if electric current is available, that the owner purchase what is termed a rectifier or small charging machine. Rectifiers of this description are produced by several manufacturers and may be procured through supply dealers at a reasonable cost. They are small devices to be attached to the wall and plugged into an ordinary electric light socket. A charge over night or for about 12 hours every 2 weeks with this apparatus will be sufficient to keep the battery in healthy condition.

When about to charge the battery, in every case it should first be inspected to see if it is filled with solution. If the solution needs replenishing, distilled water should be added until solution fully covers the plates, which may be determined by removing the vent plugs and looking down into the cells.

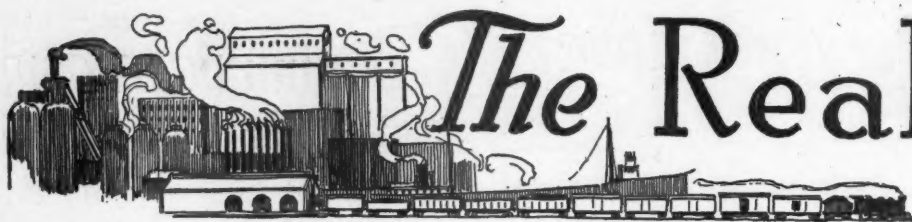
It is strongly recommended that the battery be charged on the car by its own dynamo and engine when at all possible. If, however, this is impossible and the owner does not care to incur the expense of purchasing a rectifier, there is left only one suggestion for the care of the storage battery. In this case, remove the battery from the car and arrange for its storage at a garage which has charging facilities, stipulating that it must be charged every 2 weeks. The cost of having it so cared for will be nominal and will prove insurance against serious deterioration.

Storage batteries should always be stored in a dry place, preferably where the temperature does not fall below 40 degrees F.—Willard Storage Battery Co.

## Antecedents of Words Now Part of Motor Phraseology



COUPE; plural COUPES—Derivation, French; a four-wheeled closed carriage with seats for two persons inside, with an outside seat for the driver; so called because giving the appearance of a larger carriage cut off; from couper, to cut. The term is applied in motor car parlance to enclosed bodies seating usually two passengers, one of which is the driver.



# The Realm of the

## Miners Recognize the Motor Truck

Mule, Horse and Burro Rapidly Giving Way to Power Vehicles in Far West—Great Progress Made in Last 3 Years—Road Repairs Figure in Upkeep Cost

By William B. Stout

THE motor truck is fast supplanting animal hauling for mining work in the west. Metal mining has been for years a business in which transportation has become increasingly more serious. Two-thirds of the great metal mines of the far west are many miles away from the railroads and are too frequently located in such rough country that to put it in the words of a mining man "the sure-footed burro needs tire chains to keep from skidding."

The mule, horse and burro are giving way to the motor; gasoline is taking the place of feed, and with the adoption of the motored wagons good roads are being built and developed as a matter of business.

A curious phase of truck figuring is seen in that the mining men figure road repairs as part of the upkeep cost of the vehicle.

While 3 years ago there scarcely was a motor truck in Arizona, now all the principal mining companies are using them and a contractor would not think of taking up a mining job without at least figuring on their use. Animal-hauled vehicles are fast becoming a curiosity in the big camps and the ore wagon is being relegated to the limbo of forgotten things.

### Monarch Company Satisfied

The Monarch Mining and Smelting Co., Wickenburg, Ariz., is using a 3½-ton White motor truck for ore and supplies, hauling over a 22-mile trip doing the work of two four-horse teams over very bad roads. The truck is a big success financially and more are to be put into service soon.

The Calumet and Copper Creek Mining Co., of Los Angeles, is using a 5-ton White motor truck for ore hauling with excellent results and at a great saving.

The Arizona Southwest Copper Co. of Yucca, Arizona, is using a 6½-ton Saurer truck to haul its concentrates from Copperville to the Santa Fe railway, a distance of 27 miles.

The Pioneer Smelting Co. of Corwin, Ariz., is using a 6½-ton Saurer on a 15-

mile haul making an average of six trips a day.

Other firms using motor trucks with success for hauling from mining points are the: Cineguita Copper Co. of New York; Lattimer Mining Co., Hazelton, Pa.; Jersey Valley Mines Co., Worcester, Mass.; Gilsonite Co., Denver, Colo.; Engels Copper Co., San Francisco, Cal. All of these latter firms use Saurer trucks.

### Some Roads Are Bad

The Monarch Mining and Smelting Co. is located in a sandy section of the country. The roads, in the process of improvement, are very bad. For a considerable portion of the distance of 10½ miles made in the trip to the mine there are sand washes in which the sand is very deep, hills are of exceedingly sharp pitch and roads very narrow, necessitating slow running to round the curves. In coming from the railway to the camp the machine must climb over 1,200 feet. As there are several adverse grades on the way the actual climbing is more than this.

In spite of these conditions the truck is hauling 7,500 pounds to the load, though averaging about 5,000. With the completion of the road which the firm is now building 7,000 pounds per load can be averaged. On account of the road conditions speed is low on this route 3 hours generally being taken for a trip in. Hence at present but one trip a day is made. As soon as the new road is completed two trips a day will be made.

The truck is making about 7 miles per gallon of fuel, gasoline costing at this point about 27 cents a gallon.

A four-horse team takes 2 days for the round trip between the camp and the railway, with a maximum load of about 4,000 pounds. When the new road is in the motor truck will do the work of about four four-horse outfits which cost \$8 a day. Truck cost is about \$10 per day so that under the new conditions the truck will save about \$22 per day to the firm. Motor truck drivers are paid \$3 per day. The new arrangement will allow of hauling at

a cost of about \$5 per load of 3½ tons instead of \$16 for a 2-ton load.

Besides the money gain there are many other advantages which will readily occur to any mine owner such as speed, frequency of communication if one is relying solely on the truck as a means of communication, less upkeep of outfit, and various other points against which must be set the high initial cost of the truck. The steel wheels used on the truck have been a great advantage for this climate.

The Arizona Southwest Copper Co. of Yucca, Ariz., uses a 6½-ton Saurer on a 27-mile haul. During the first 2 months of motor truck use the firm used the machine to haul heavy mill machinery and supplies to the mine, thus reducing the cost from \$15 per ton to less than \$5.

The same firm tried several makes of trucks with smaller motors and found them not powerful enough or reliable enough for the heavy hauling of this route. The present truck has run on regular schedule without hitch. The first 15 miles of the run is a continuous upgrade of from 2 to 4 per cent over desert roads with a number of deep sand washes. The truck makes no work whatever of crossing this sand when fully loaded, the low gear being seldom used.

The next 7 miles is a steep climb up the Wallapai mountains and it takes the truck 2½ hours to make the distance. The grades on this section are from 10 to 15 per cent. The load gear is used exclusively for this distance. The truck makes this climb without a sign of overheating.

### Tires Stand Up Well

The last 5 miles is a downhill grade of from 6 to 8 per cent to the mines. The road surface is fairly good and the Goodrich tires with which the car is equipped show very little wear after 3,000 miles of service. They should last to at least 8,000 miles, it is declared.

When the company's mill is in operation the hauling conditions will be reversed, as the truck will have only 5 miles uphill with load and practically 22 miles downhill to the railroad.

In hauling lumber and supplies to the mine the round trip of 54 miles was made in one day but as the loading and unloading of the heavy machinery had to be done by hand the average time during the first month was 1½ days for the round trip. Previously the company paid \$15



# Commercial Car



## Arizona Concerns Using Many Trucks

per ton on this haul and it took 4 days to make the round trip with horses.

The following cost figures have been taken as average, for the first month's operation:

Gasoline, 19 gallons at 30c.....	\$ 5.70
Oil, 5 quarts at 20c.....	1.00
Grease, 1 pound at 12c.....	.12
Driver, 1½ days at \$4 per day.....	6.00

Total visible expense.....\$12.82  
Upkeep expense is given at the following figures:

Interest on investment at 6 per cent and insurance for 1½ days.....	\$2.11
Depreciation at 10 per cent.....	2.67
Repairs.....	2.25
Tires.....	2.83

Total cost per round trip, hauling 5 tons one way.....\$22.86

Cost per ton.....	4.53
Former cost with teams by contract.....	15.00
Saving per ton.....	10.46
Saving per load.....	52.30
Saving in 3 months, about.....	4,000.00

### Cost Will Be Reduced

The manager of the concern figures that with the completion of the mill and hauling ore to the railroad as well as hauling supplies back to the mill he will reduce his cost per ton to less than \$4. Five Saurer trucks will be used to take care of the work.

Other Arizona mining companies are using motor trucks with success as against mule and horse hauling including the Copper Queen, Calumet and Arizona, Copper Creek, Arizona Southwestern Copper, Pioneer Smelting, United Verde, Inspiration, Gold Road, Miami and others.

In Globe, Bisbee, Clifton, Jerome, Kingman and other camps of this western state the motor truck, once looked at with scorn is respected for what it is doing.

In the earlier attempts motor trucks failed to meet the requirements of this country and work, but modern machines are proving a complete success. Nearly all the trucks in use at these mines have dumping bodies. There is little demand for any other kind of truck, for nine-tenths of the freight handled is ore, coal

### Examples When Motor Vehicles Save Money in the Handling of Ores—Adoption of New Method of Transportation Has Called Attention to Need of Better Roads

and coke. In a few isolated instances trucks are used with ordinary bodies for transporting provisions and merchandise, but as a rule the purchaser prefers to buy a machine that he can use for freighting ore if possible. Trucks are generally of 5-ton capacity and large engines are in preference. The Saurer is a favorite in this territory, with Packards, Macks and Alcos close behind.

The Pioneer Smelting Co., near Tucson, uses motors to transport ore from the Plumed Knight mine to the smelter. The distance is 7½ miles and each truck makes six round trips a day with a load of at least 6 tons. The cost is 75 cents per ton. With mules and wagons the cost was from \$1.50 to \$2 a ton. At this rate each truck is saving the firm about \$13,500 per year.

Two drivers are used on a truck, each making three trips a day to the smelter. Between the smelter and the mine is a steep up-grade of 8 to 12 per cent.

### Condition of Highways

The roads are fair except the first 2 miles from the smelter which section is very sandy and, during the long, dry season, cuts up very badly. The truck is set to run at 10 miles per hour and, with the exception of the steepest hills, averages that for the trip both ways. The machine has been in use for 9 months and has covered some 17,000 miles, delivering 36 to 40 tons of ore a day to the smelter, besides the hauling of all supplies from the smelter to the mine. It would require from thirty-six to forty animals to do the same work in the same time. The cost figures on the truck are based on repairs and renewals, interest on investment, oper-

ating costs and also on road repairs.

The first 3 months operation showed a cost of 72 cents per ton but road repairs and renewals on trucks have been higher since then bringing up the cost per ton.

The first set of tires—Goodrich wireless—ran 11,500 miles front and 9,700 rear although the firm does not consider it economy to run them as long as this.

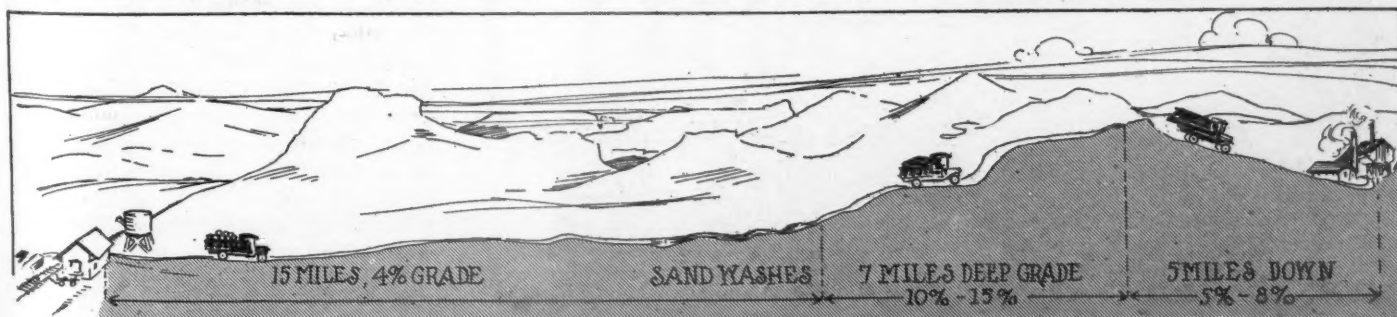
### Views of Superintendent

"Wherever the road conditions are even fair," says the superintendent of this concern, "the truck will show a substantial saving over the horse, and the relative efficiency of the truck over the horse will increase in direct proportion to the improved condition of the roads.

"One of the requirements of a truck for work in this climate is some form of metal wheels, as wooden wheels will not stand up in desert work."

While the motor truck is making good in mining work it is at the same time proving itself a benefit to whole sections of country through the good roads influence radiating from every point where the new vehicles are in use. As roads improve so will motor transportation increase. Whereas the pleasure car demands good roads from a comfort standpoint and for speed, the motor truck coming onto country roads demands good surfaces as a matter of dollars and cents, which only means that in those sections where distance hauling is common as is found in the mining states, there good roads will have the first chance to develop.

The successful use of trucks for mining work will no doubt lead to its similar adoption in other lines.



ILLUSTRATING GRADES ENCOUNTERED ON TRIP FOR PIONEER SMELTING CO.

# Congestions at the Freight Stations

**N**EARLY all of the freight stations of Chicago have about the same problems to meet, though in differing degrees. The chief loss at all stations is due to the influence of horse pace and the resultant laziness of drivers.

Following last week's story data has been obtained from other Chicago freight stations which bears out and emphasizes the points pointed out in the former article as needing attention.

## Grand Trunk and Wabash

The traffic of the Grand Trunk and Wabash freight yards is controlled by much the same hindrances that were mentioned in connection with the Lake Shore station. The railroads mentioned handle all the in freight at two opposite platforms situated on a 45-foot street. Down the center of this street a storage-battery street car operates, adding to team congestion.

The buildings are constructed with 10-foot doors, 15 to 20 feet apart with blind walls between. The Grand Trunk building is about 25 years old while the Wabash is comparatively new, though traffic conditions are much the same at both platforms, and loading takes about as much time at one place as the other. The street is in very poor condition. Not more than five motor trucks come to this street in a day, for either railroad.

Wagons that cannot get to a door back up against a blank wall. When the door is cleared they must then switch back and forth for from 2 to 5 minutes before they can maneuver to position for loading. Much is done unnecessarily, especially on the Grand Trunk side, for the railroad is willing inside the warehouse to truck the goods the length of the platform to accommodate teamsters in a hurry.

When the platforms are full on both sides there is just room for the electric

## More About Motor Trucking Problems That Are Found in Chicago

car to pass between. It usually takes the car from 7 to 10 minutes to run two blocks through this district.

Most of the business at the Grand Trunk platform is handled in the forenoon. At this time the whole complement of men is put on the loading force. The business through the tunnel is about one-third of the street business. The tunnel cars are handled in slack moments of horse service. The foreman of the platform claims that the chief delays are from the wagon end, firms often sending but one man to load an 8,000-pound load. At the present time the narrow doors hinder and there could be much better service if the whole platform were thrown open. The inside gang is always ahead of the outside men, according to the foreman.

A large amount of the work is transfer freight which is handled by the Arthur Dixon Transfer Co. These loads are mixed and require a great deal of hand trucking for each load. In spite of this the truckers give the wagons their loads at the platforms faster than the drivers can load on. Much time is lost in backing in and in tying on the load also. One driver timed took 10 minutes after the load was on in roping. Another delay was noted where a driver, after backing up to a door for which others were waiting, stood and talked to a loiterer for 15 minutes without handing in his bill of lading or making any attempt to get his goods.

The approach to the platforms runs under a street viaduct. A great deal of delay in getting in is caused by the obstruction of teams under the viaduct, the drivers sleeping or drinking, it is said. This is

worst from 11 to 1, each day. The chief delay of all, according to the foreman, is due to the soldiering habits of the teamsters. What few motor trucks come to these yards are served quicker than the average wagon on account of the greater alertness of the drivers.

In the afternoon when the street traffic is light, the tunnel cars are loaded and the piles of goods arranged. Boss unloaders direct the stacking and sorting of the goods off the cars to the best advantage of the truckers who load. In arriving at the platform the driver merely hands his bill of lading to the nearest trucker inside, who hands it to the boss trucker. This man will assign one or two truckers, depending on the size of the load. He signs but once for each bill of goods.

## Wabash Freight System

In the Wabash freight system, separate men unload the cars. The truckers have nothing to do with it. The unloaders stack the goods on the floor at the handiest place near where they unload it. Wagons are loaded in the morning and tunnel cars in the afternoon. About one-third of the freight goes through the tunnels.

Long delays are caused by the trouble in finding things on the floor, as the unloaders have no special system of stacking in order. Clerical delays are also noticeable as every trucker is his own clerk. There is but one trucker assigned to a wagon. He has to find the goods, truck it to the wagon, wait until it is loaded and then accompany the driver to the office, where the driver signs all of the load. Several signatures have to be affixed to each bill of goods.

The fact that unloaders, having nothing to do with loaders, make it difficult to locate a load. Afternoons are spent in loading tunnel cars and in resorting freight left on the platforms. The foreman mentioned delays through the laziness of the drivers in the street but said that, being a public street, there was no way to make them move on or hurry. The foreman gets all his orders from the office and does not contemplate any change in system.

## Service at Freight Yards

A 3-ton truck belonging to the Dixon Teaming Co. arrived at the platform of the Illinois Central on November 11 at 7 a. m. and did not leave with its load until 11:30, a wait of 4 hours and 30 minutes for a 4-ton load. Another Dixon team which had arrived at 11 a. m. did not leave until 4:03 p. m., a wait of 5 hours and 3 minutes.

When proper loading facilities are furnished motor trucks will be put in service for all of the freight hauling, saving thousands of dollars a year.



FOUR-WHEEL DRIVE TRUCK WITH STAKED BODY



# Four-Wheel Drive as Applied to Trucks

NOW that the gasoline motor has been developed to a state where manufacturers content themselves with minor refinements in its further development, the removal of its most serious handicap,—inefficiency in the application of its power, has been undertaken in earnest, and is receiving more attention from practical engineers. It has been learned that large wheels and broad tires increase tractive efficiency because of the increase of traction area. But there are limits which restrict the size of wheels, especially so in motor truck design, where the height of the floor of the body is directly affected by the size of the wheels.

Four-wheel drive therefore is considered by some of the engineers as a logical development in design. This has been recognized in railway traction for several decades, but the application of this principle to road traction presented grave difficulties, among which the most serious were the allowance for the steering of the wheels and the friction resulting from the necessarily great length of the transmission line.

Judging from the results that have been obtained in the development of this idea, as embodied in the product of the Four-Wheel Drive Auto Co., Clintonville, Wis., these objections were either not so serious as first imagined, or they have been well overcome by the manufacturers of trucks of this type; as shown in the recent government army trials, in which these trucks made an excellent showing.

## Four-Wheel Drive Advantages

The principal advantages accruing to four-wheel drive are doubled traction area, more positive drive in turning, ability to control skidding, due to the front wheel traction, and better distribution of load on tires, and consequent saving in tire-wear.

Four-wheel drive trucks are made in two capacities for 1913, 1½ ton and 3 ton, respectively. The former is supplied with a 29-horsepower, and the latter with a

## Description of Motor Vehicles Made by Clintonville, Wis. Concern

36-horsepower engine. They are almost identical, except as to size, and a differential lock, which is fitted to the larger model, but which is missing in the smaller one. The general chassis specifications, which apply to both sizes are as follows: The motors are of four cylinders, fitted with ball governors. These motors are water-cooled, and equipped with Stromberg carbureters, Bosch high-tension dual ignition, and force-feed lubrication. The Hele-Shaw multiple-disk clutch is used, and drives to a gearset of special design. This gearset is of the individual, solid-jaw clutch pattern, with the gears constantly in mesh, and provides three forward speeds and a reverse, on the selective principle. Drive from the gearset is by silent chains to a differential, suspended amidships.

## Driving Mechanism

Shafts drive from the center differential to each axle, where the transmission is by the usual bevel gear drive and differential. It is thus seen that three differentials are used. This is necessary to allow for the different speeds of wheels on the same axle, and the different speeds

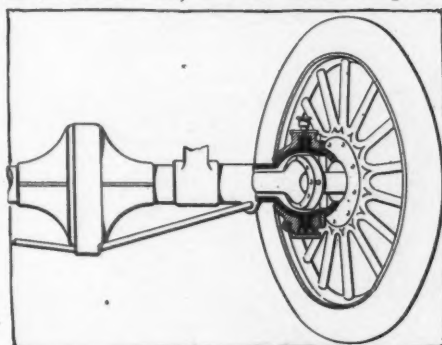
of the axles. On the large car, a differential lock is supplied to lock the center differential, so as to drive on one axle only, should the necessity arise. A large brake is fitted to the end of the transmission shaft, which acts on all four wheels, through the differentials. Control and steer is standard, and from the right hand.

The manner in which the same axle is made to allow motion of the wheels in steering, and to transmit drive as well, is interesting. The front axle is substantially a floating shaft-driven axle, the ends of which are in the form of ball-shaped steering knuckles. These are of course hollow, and contain universal joints, by which the drive is transmitted to the wheels from the floating axle-shafts. The rear axle is of the ordinary floating type. V-shaped tubular torque members secured at their inner ends to spring hangers at the middle or primary differential, are used in propulsion, and to maintain the alignment of the axles.

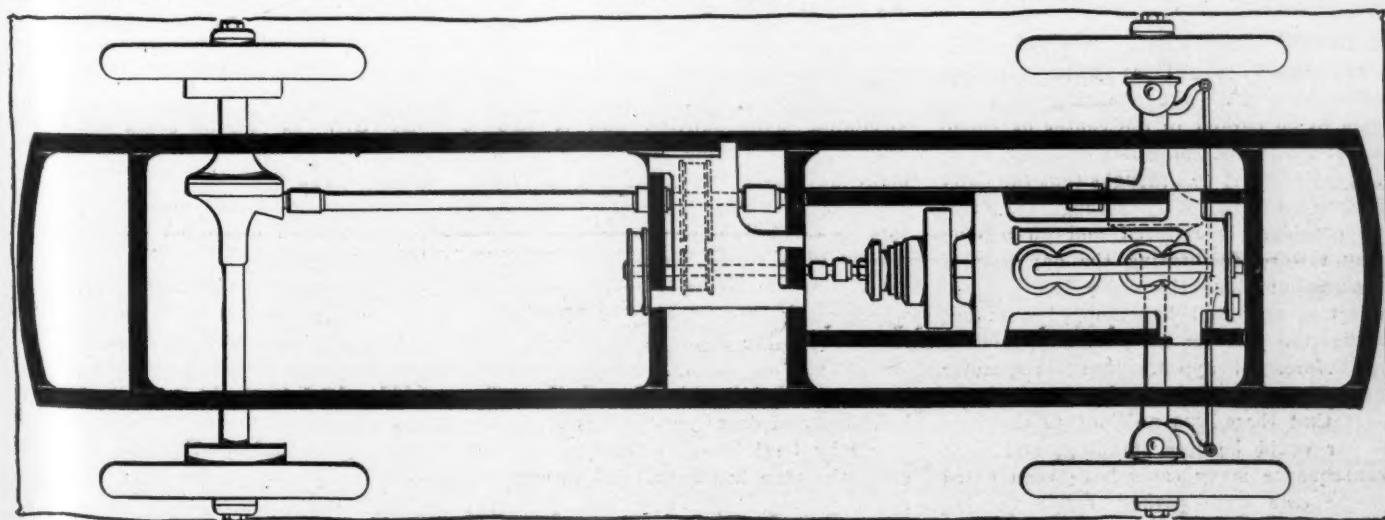
The motor is suspended on a subframe, beneath the seats, while the radiator is carried in front on flexible mountings. This form of construction, popularly called the American type, leaves a large amount of loading space forward of the rear axle, while the weight of the motor and driver are carried mainly by the front wheels. This is of course essential to bring, as nearly as possible, equal loads on all wheels.

## Facts About Small Model

The small car has a wheelbase of 124 inches, and a loading space 11 feet 4 inches in length, while the larger model has a wheelbase of but 120 inches, with a loading space the same size as its smaller brother. Tires are 36 by 4 inches in size all around; 20 gallons of gasoline are carried, and the chassis are sold with lamps, tool kit, and horn. Bodies are specially built to suit the requirements of the purchaser.



STEERING AND DRIVING JOINT ON FOUR-WHEEL DRIVE FRONT AXLE



CHASSIS VIEW OF THE FOUR-WHEEL DRIVE MOTOR TRUCK

**URUGUAY Show Postponed**—Due to unavoidable delays, it has been necessary for the government to postpone the international competition of agricultural motor vehicles at Montevideo, Uruguay, until March 31, 1913.

**Iowa Road Men to Meet**—The Iowa Good Roads Association will hold its annual meeting in Des Moines some time in December. The good roads boosters are going to make a fight for state aid. F. J. Tisbenbanner, of Gilmore, is fathering a plan for good roads which will be presented to the meeting for support. He would have the state motor tax, which now yields \$500,000, spent to buy crushed rock, which is to be shipped free to the different counties of the state.

**Oregon Takes Backward Step**—The citizens of Oregon have turned down the state highway appropriation for good roads. In fact, they turned down every amendment that called for the expenditure of money. So far as the state is concerned, there will be no good roads work done until after another election. The people did, however, vote to allow counties to issue bonds for road work, but this is not of importance, for before their bonds can be issued they will have to be voted upon by the county citizens, and by the recent election it can easily be seen that there will be no chance of carrying the point that way.

**Booming Roads in Illinois**—The Illinois Highway Improvement Association has decided to hold weekly meetings in the principal cities of the state in order that the officers can become acquainted with the good roads boosters in each district and secure uniformity of action in the movement for state highways. The first of these meetings will be held in Bloomington and each city will be visited in turn. The association will probably also support a bill which abolishes the present system of township road commissioners and places in the hands of the state general supervision of the construction and maintenance of the public highways. Chairman Homer J. Tice of the legislative commission is now giving the finishing touches to the bill.

**Another Traffic Evil Develops**—When Philadelphia regulations were put into effect some time ago requiring all motor cars to be parked in the center of Broad street instead of being left standing along the curb line, it was thought that the daily congestion of that busy thoroughfare would be considerably relieved and go a long way toward facilitating the handling of traffic, but since the order has been in effect a new evil has cropped out that makes the problem as difficult of solution as before. It appears that some motor car users have taken advantage of the fact that there was no limit to the time a car could be left standing, and as a consequence many cases have been noted where cars were parked from morning until night, defeating the very purpose of

## From the

the order. That Broad street cannot be used as a public garage is the ultimatum of the department of public safety, and the experiment will be tried of limiting the parking of cars to 1 hour at a stretch.

**Milwaukee Sets Dates**—The Milwaukee Automobile Dealers' Association has selected the period from January 11 to 18, 1913, as Milwaukee show week, during which the fifth annual motor show will be held in the Auditorium.

**Winnipeg Working Hard**—After several years of hard work on the part of the Manitoba Good Roads Association some good results are becoming apparent. A by-law has been passed by the municipality of Kildonan which provides for the construction of 5 miles of concrete highway from the northern limits of the city of Winnipeg to the limit of the Kildonan municipality on the highway to Selkirk. There is every possibility that the work will be continued from this point by the

of their being damaged by some careless driver in the street. The new ordinance allows a car to stand at the curb so long as a person capable of handling the car remains in it.

**Convict Labor Retained**—Permission has been granted for the continuation of the policy of using convicts on road work in Louisiana. All convicts that can be spared from the penal farms will be used on the road during 1913, as they have been this year. It is hoped to improve at least 100 miles of highway with the convict gangs alone.

**Cincinnati Club Hustling**—The Cincinnati Automobile Club will change its headquarters when the new Gibson Hotel is completed. The club is now temporarily located on Fourth avenue. There will be about one-half dozen gayly decorated rooms. The club will be located on the fourth floor. A new country club may be added to the general utility for the

## Old Roads Made New—No. 5—In South Carolina



**H**ERE is an example of contrasts as furnished by photographic evidence in the hands of Logan Waller Page of the department of public roads at Washington. Both scenes show the same stretch of roads near Cheraw, S. C. The first one shows the road before any improvements were made. The second shows the same highway after it was rebuilt and after it had seen 18 months' service.

adjoining municipalities, and if this is done it will provide the first link in a main highway between the city of Winnipeg and Winnipeg Beach, the pleasure resort on Lake Winnipeg.

**New Plan Works Well**—Little hardship has resulted from the recent city ordinance which forbids the parking of a car along the curb in the business district in New Orleans, as any number of garages have sprung up in the vicinity of the office buildings and department stores where the cars may be left conveniently. In fact, since the plan has been tried owners are not objecting. Cars now are protected from the elements and there is no danger

motorists. If present plans are adopted the country home will be located out about 6 or 7 miles from the city. Lawn tennis courts and golf links may be built. The cost has been estimated at \$20,000 or \$30,000.

**Ohio Counts Chauffeurs**—There has been an increase of 2,750 in the number of licensed chauffeurs in Ohio within the past 2 years. In 1910 there was a total of 5,135. Last year the number was 6,402, which was at that time equal to any other state in the union. But this year—with 30 days more before the records are closed—the number aggregates 7,885 and nets the state the sum of \$15,770. The fiscal



# Four Winds

year ends on December 15, and it is expected that before that time the total number of licensed chauffeurs will exceed 7,900.

**Tennessee Would Tax**—A \$3 tax on each of the 8,700 cars in Tennessee is proposed by C. C. Gilbert, the secretary of the Nashville Automobile Club. The money raised in this way is to be devoted to road improvement. By applying this fund annually to that which will be contributed by the state and county authorities, road improvement can be hastened greatly, he says.

**Texans After New Road**—At a meeting of representatives of nearly every county between San Antonio and Houston, Texas, through which the proposed highway between those cities is to run, held at Victoria on November 20, there was organized the Alamo-Victoria-San Jacinto Highway Association. The purpose of this organization is to carry out the plans for the construction of the proposed road. J. P. Pool, county judge of Victoria county, was elected president of the association, and D. E. Colp, of San Antonio, secretary.

**Iowans Choose Officers**—The executive committee of the Iowa Automobile Association held a meeting in Des Moines last week and elected the following officers: President, G. D. French, Davenport; vice-president, L. J. Dickenson, Algona; second vice-president, C. N. Wyckoff, Sioux City; secretary-treasurer, H. Leslie Smith, Des Moines. W. E. Moyer, retiring president, was made chairman of a legislative committee which will work in the coming session of the Iowa legislature for macadamized roads in the state.

**Saved by Self-Starter**—A citizen of Nashville, Tenn., who is the possessor of a new six-cylinder Hudson, was nearing the N. and C. Railroad crossing on the Harding road when the headlight of an approaching motor car blinded him so that instead of following the road, which makes a turn as it crosses the railroad track, he drove straight on up the

track itself for about 30 feet before he could stop his car. Putting on his brakes too quickly, he checked his motor just as an approaching train whistled for the crossing. It seemed as if there was no chance to escape a bad accident, but with quick presence of mind he touched the electric self-starter button and the motor immediately started. Quickly putting the car into reverse gear, he backed down the track and out into the road, clearing the track just a second before the train thundered by.

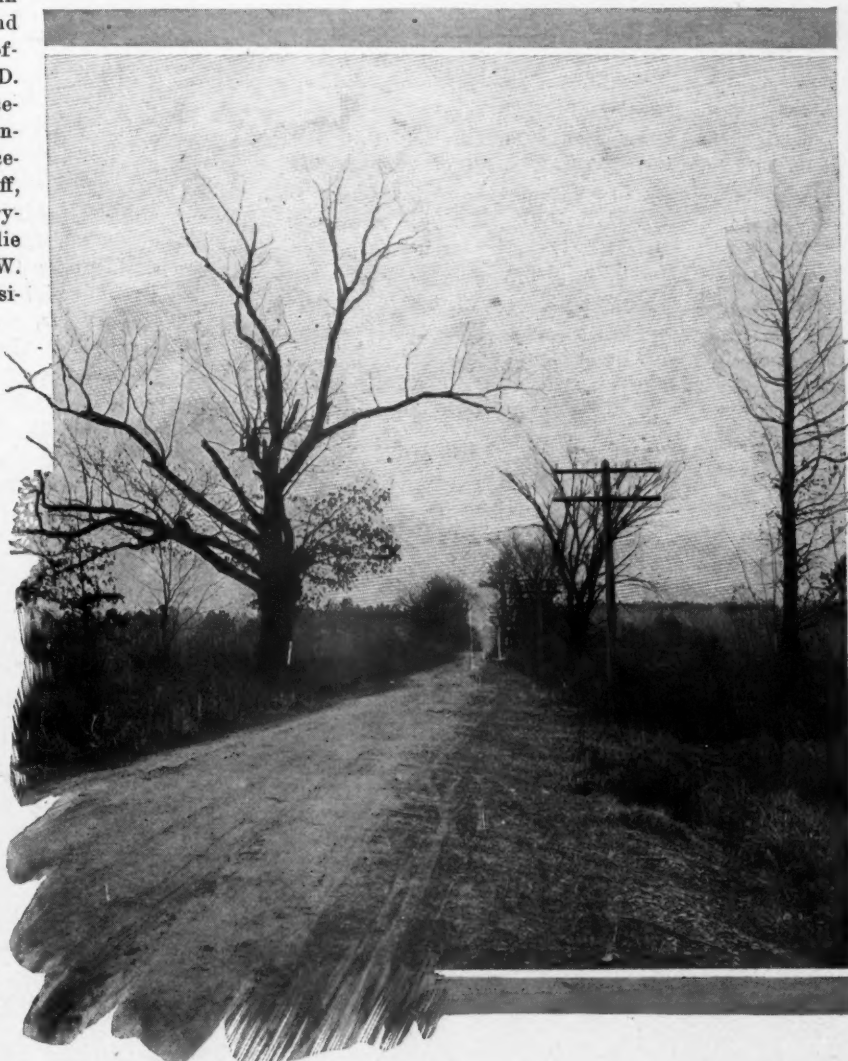
**Sentiment Changing**—In no states of the union has the prejudice in rural districts against the motor car been as strong as in Louisiana and Mississippi. While there is plenty of this bias to be observed in certain sections, it is a noticeable fact that along the improved roads where motor cars are being used more than any other vehicle that the old spirit has changed. Even the negroes, who are slowest to become reconciled to the new form of transportation, are no longer hostile. As little of the land in Louisiana and Mississippi is fenced, live stock of all kinds is often found in the road. In some cases chickens, pigs and sheep have been killed by motor cars.

This, in addition to frightening horses, has been the cause of the prejudice, but as there is no denying, even on the part of the most ignorant, that the good roads have been a result of the motor car, resentment is changing to gratefulness. Off the main lines of travel much of the old sentiment still is found.

**Ruling on Insurance**—In an opinion given to H. J. Shively, state insurance commissioner, Attorney General W. V. Tanner, of the state of Washington, holds that an insurance company cannot insure owners of motor cars against loss by reason of accidents to their machines, and also against damage for injuries to persons at the same time.

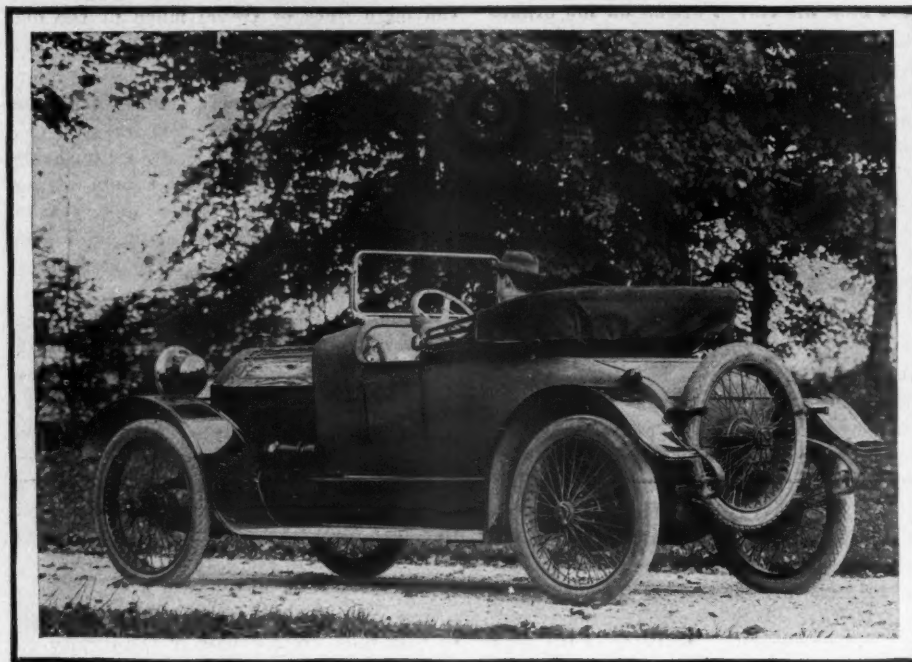
**Demands Wide Tires**—A campaign against narrow-tired wagons, particularly those designed to carry heavy loads, has been commenced by the good roads committee of the Milwaukee Automobile Club, with special reference to Milwaukee county roads. Concerns employing horse-drawn trucks with narrow tires have been asked to adopt broad felloe wheels taking steel tires or rims of more than 3-inch width. Dairy companies have been requested to ask owners of horse-drawn equipment used to haul milk from depots in the county to Milwaukee to use wide tired wheels.

**Sues Milwaukee Promoters**—An echo of the results of the postponement of the various events at Milwaukee October 2, 3 and 5, commonly known as the Vanderbilt cup races, is found in the suit instituted at Milwaukee last week by William Wallace, of Philadelphia, Pa., who has extensive business interests in Milwaukee. Mr. Wallace demands the refund of \$120 which he paid for admission tickets and reserved seats. The complaint says Mr. Wallace arrived in Milwaukee 2 days before the time originally set for the races, September 17, 20 and 21, and bought tickets which cost \$120. When the races were postponed, he made several exchanges and additional purchases of tickets, the net result of which was that he invested \$7 more. When the races were postponed again, he found himself unable to wait and was unable to sell his tickets. The suit will be tried in the Milwaukee county civil court on December 2. The result of this lawsuit is awaited with interest as likely to set a precedent that can be used in the future.





# Among the Makers and Dealers



NEW HENDERSON MODEL PUT OUT

**T**HE HENDERSON MOTOR CAR CO., Indianapolis, has just announced its new model 47 in touring and roadster form. It is featured by having wire wheels. Such characteristic Henderson features as dash gasoline tank, dynamo lighting system, and left-hand drive are retained

**G**RANT Joins Jackson Agency—Harry F. Grant, twice a winner of the Vanderbilt trophy, has joined the sales force of the Boston branch of the Jackson car.

**Seattle Show in December**—Seattle will have a show this year. It will be held in the Armory and last 6 days from December 16 to 21. D. B. Duncombe will stage the event.

**Goodyear Still Building**—A building permit was issued recently to the Goodyear Rubber Co., of Akron, O., for the erection of a new factory building, which is the sixth one to be erected this year. The building mentioned will be one of the largest that have been erected, the dimensions being 100 by 260 feet and is seven stories high. The cost of the new building will be about \$100,000.

**Suburban Company Reorganized**—The Suburban Motor Car Co., which has in construction a car factory at Ecorse, a suburb of Detroit, has been reorganized under the name of the Palmer Motor Car Co., of which R. A. Palmer, former general manager of the Cartecar company, Pontiac, Mich., is vice-president and general manager. Mr. Palmer also is president of the Palmer-Bee Co., dealer in power transmission machinery and factory equipment. The Ecorse plant is about half completed and it is hoped that it can be finished so that manufacturing may be commenced along about the first of the year, at which time announcement of the type of machines which it contemplates making will

be given out by the new Palmer company. W. A. DeSchaum, who designed the Suburban car, will not be connected with the concern.

**To Make Chains**—The Federal Chain and Mfg. Co. of Springfield, Mass., has purchased from the Atlas Chain Co., of Brooklyn, N. Y., all rights to manufacture and sell Gaylord traction grips for commercial vehicles.

**Ramsey Becomes Body Maker**—J. J. Ramsey has become vice-president and treasurer of the A. C. Knapp Co., body maker, of Detroit. Mr. Knapp's former connection was with the E. R. Thomas company, Buffalo, of which he was secretary and treasurer.

**Fight for Mais Money**—Stockholders and creditors of the old Mais Motor Car Co. are making a lively fight in the superior court in Indianapolis to determine which shall receive about \$80,000 which is in the hands of Franklin Vonnegut, receiver for the concern. The property and business of the company was sold some time ago to a reorganized company by the same name, headed by Frank H. Wheeler. When the company was in debt about \$180,000 and before the receivership proceedings had been brought, creditors agreed to an extension of time if they should receive a payment of \$75,000. The company raised \$67,000 in cash and a note for \$8,000, and paid the money to the creditors. The stockholders now claim that the creditors were to receive nothing unless they re-

ceived the full amount of \$75,000 and that the payment of \$67,000 therefore was illegal. They also claim they have a trust interest in the money in the receiver's hands.

**Municipal Motor School Planned**—Mayor John F. Fitzgerald of Boston is working hard to arrange for a municipal school for instruction free to men who wish to learn how to operate and repair motor cars and trucks. He has sent a communication to the Boston chamber of commerce on the subject.

**Opens Branch Warehouse in Atlanta**—The H. W. Johns-Manville Co. has recently opened a new southern warehouse at 31½ South Broad street, Atlanta, Ga. The entire building, embracing three floors and a basement, with a total floor area of about 10,000 square feet, will be utilized exclusively as a warehouse for a stock of J-M products.

**Adding to Packard Plant**—More than 500 orders for the 1913 Packard 38 have been received, the total of advance sales exceeding \$2,000,000, it is reported. To expedite the manufacture of the 38 and future models, the Packard plant, already comprising 37 acres of floor space, is being enlarged. Three buildings, constructed entirely of glass, concrete and steel, have been erected to conform to the Packard factory's system of shop units. The additions are practically complete and will be ready for occupancy by January 1.

**To Use Manly Drive**—The Hydraulic Auto-Truck Corporation has been organized under the California state laws to build commercial vehicles using the Manly hydraulic drive, for which it has secured a license from the Manly Drive Co., of New York city. The directors are: W. E. Barnes; H. W. Whitford, T. W. Burger, T. L. McFadden, D. L. Whitford, J. J. Kinahan and M. R. Jacobs. D. L. Whitford is the general manager. The Hydraulic Auto-Truck Corporation, besides having secured a license to build the transmission, has also secured the agency for the American La France truck, also equipped with this drive, for the Pacific coast states. It is the intention of the company to build trucks of sizes ranging from 1 to 6 tons, and later as the Los Angeles harbor is opened up—which will be immediately upon the completion of the Panama canal—it is its intention to enter that field with its big trucks and trailers. This transportation business, from every indication, will be enormous, inasmuch as the merchants of Los Angeles will be able to transport merchandise some 22 miles with the quickest possible dispatch instead of having to depend upon the railroad, not even excepting the projected municipal



railroad which Los Angeles will build to take care of the tonnage that will be brought to her doors. The general offices are at the corner of Pico and Grand streets, Los Angeles, Cal.

**New Luverne Model**—The Luverne Automobile Co., Luverne, Minn., has added a four-cylinder chassis of 40 horsepower to its line of six-cylinder pleasure cars. The chassis will be sold from the factory direct only. It is suitable for either business or pleasure bodies.

**Farkas Makes a Change**—The Cass Motor Truck Co., Port Huron, Mich., has engaged E. J. Farkas, formerly chief engineer of the Cartercar company, Pontiac, Mich., as consulting engineer. He is at present engaged in developing a line of trucks for the concern, and is located at 402 Ford building, this city.

**New Tire Ready for Market**—The St. Louis Tire and Rubber Co., which has been organized recently in St. Louis, turned out the first solid tire Saturday. This is the first solid rubber motor tire to be made west of the Mississippi river, it is claimed. The company obtained possession of its building on November 6, broke ground for its engine on the same day, unloaded all the machinery from the cars, placed same in running order and turned out a tire in 17 days. J. A. Swinehart, general manager, states that there is no foundation to the report that the St. Louis concern is a branch of the Swinehart company of Akron.

**Pushing Work on Axle Plant**—Work on the new three-story and basement addition to the Timken-Detroit axle plant is being pushed rapidly. The brick and steel structure is 60 feet wide and 275 feet long. On the first three floors the materials used in the manufacture of Timken-Detroit axles will be stored. On the top floor the general offices of the company will be located. This is the second big addition which has been erected within the year. The two buildings will increase manufacturing space about 33 1/3 per cent. One hundred thousand dollars' worth of new machinery will be installed and 300 more men employed.

**To Make Moore Trucks**—The Palmer-Moore Co., of Syracuse, N. Y., for the past 2 years builder of the Moore two-cycle engine, has increased its capital to \$200,000, fully paid in, and is at once to begin the manufacture of motor trucks. T. G. Meacham is president of the corporation; T. W. Meachem, vice-president, and Charles L. Palmer, secretary-treasurer. The large plant of the Syracuse Stove Works, including 3 1/2 acres of land and 90,000 feet of floor space, has been purchased by the new company and is being rapidly equipped with new machinery with a view to turning out the first 200 trucks within 6 months. The type of vehicle to be turned out exclusively at the start will be a 1,500-pound delivery wagon called the Moore. Among the prominent features of

this truck will be the air-cooled, two-cycle, slow-speed, variable-port Moore engine and a transmission that automatically provides protection from gear breakage resulting from quick shifts or reversals.

**Toledo Chooses December**—The date of the Toledo show has been set for January 21-26. There will be plenty of floor space and the show will be open to all who wish to exhibit. The directors of the Toledo Automobile Shows Co. is after the Exposition building on Cherry street.

**Moon Dividend Declared**—At a recent meeting of the board of directors of the Moon Motor Car Co. a 10 per cent cash dividend was declared upon the capital stock, and payable from surplus. This is the second dividend this year, and the fourth consecutive one for this amount.

**Franklin Managers Meet**—At the annual conference of the district sales managers of the Franklin Automobile Co. held in Syracuse, N. Y., last week reports coming from all parts of the country indicate that the 1913 season will be larger in point of sales than any other in the history of the company. The conference lasted for 2 days.

**Overland Reincorporates**—The Willys-Overland Co. was reincorporated last week with a capital stock of \$25,000,000, the capital stock of the old concern being \$15,000,000. All assets of the concern are taken in by the reincorporation, including the plants at Lima, Elyria and other places. An official made the statement: "Instead of increasing the capital stock of the old company, the company was reincorporated and everything is included in it." The personnel of the present company will not be disturbed by the

reincorporation and the officers will remain the same. The incorporators were Walter Stewart, Isaac Kinsey, R. R. Scott, A. H. Smith and G. W. Bennett.

**Fire on Chicago's Bow**—A fire broke out last Thursday in the local store of the Nyberg Automobile Works, 2437 Michigan avenue, Chicago, causing a loss estimated at \$15,000.

**Van Linden Joins Olds**—The Olds Motor Works, Lansing, Mich., now has E. R. Van Linden as its factory manager, G. D. Baker, who formerly held that position, having resigned to become manager of the Diesel engine plant, Ghent, Belgium. Mr. Van Linden held a similar position with the Buick plant No. 1 at Flint, Mich.

**New Title for Nelson**—E. A. Nelson, the chief engineer of the Hupp Motor Car Co., has given up the active duties of that office and assumed the title of consulting engineer. The position of chief engineer will be taken over by F. E. Watts, his former assistant, and Don T. Hastings, formerly of the Packard Motor Co., will succeed to the title of assistant chief engineer. Together with General Manager C. D. Hastings and Export Manager C. H. Dunlap, Mr. Nelson will sail Saturday for the Paris show. The party will spend the month of December visiting the show and some of the cities of continental Europe, returning by way of London in time for the opening of the New York show. Mr. Nelson will return in February. John L. Poole, European export manager, has called a convention of European dealers to meet the Hupp officials in Paris, and invitations have been issued for the first annual Hupmobile European dealers' banquet at the Hotel Marguery on December 13.



DIVERS RESCUE WATROUS' HUPMOBILE

**I**t was Howard Watrous who gave Charles J. Glidden 2 days' start over the Glidden trail and then caught up with the tourist before he reached New Orleans. On the return trip Watrous shipped his Hupmobile across Lake Pontchartrain but the boat was wrecked. Watrous rescued his car several days later, divers helping him

### New Woodworth Treads

TO afford a grip on brick, asphalt and ice, a new type of tread has been adopted by the Leather Tire Goods Co., Niagara Falls, N. Y., for its Woodworth treads. As in former Woodworths, the new tread consists of a heavy chrome leather tire covering, stoutly riveted together, and provided with steel studs on the tread for the purpose of reducing wear, securing traction, and preventing skidding. The new arrangement includes, in addition to the five rows of round steel studs, a series of large sharp studs, about 2 inches apart, and staggered, projecting about  $\frac{1}{4}$  inch above the level of the other rivets, which afford a grip on ice and hard snow. These are hardened, and are screwed in place, permitting easy removal and replacement when worn. The former tread fabric is retained, and coil-spring fasteners, that have been used in the past. They are also continued in the full-studded types, especially adapted to rough and rutty roads.

Another feature that is offered for 1913 is the take-up clip. This clip has two adjustments, for standard and over-size tires. These clips, shown in Fig. 2, consist of a clincher hook, which fits

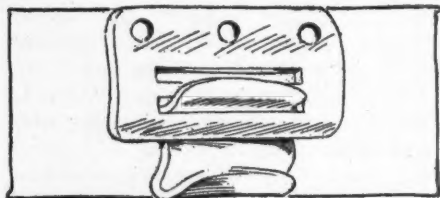


FIG. 2—ADJUSTABLE CLIP OF WOODWORTH TREAD

the clincher rim, and the buckle, into which this hook fastens. The buckle is secured to the leather tread by means of three rivets.

### Wagner A. C. Rectifier

For use in charging ignition and lighting storage batteries, the Wagner Electric Mfg. Co., St. Louis, Mo., has produced the alternating-current rectifier shown in Fig. 4. This rectifier takes current from any 110-volt lighting or power circuit, transforming and rectifying it to adapt it to the charging of storage cells. The apparatus consists of three parts in one case. These parts are a small transformer, which steps down the voltage, a vibratory rectifier, to permit current impulses of but one direction to flow into the battery, and a resistance which restricts the flow of charging current. The rectifier consists of a vibrating armature and an electromagnet. The action consists of drawing down the armature by the magnet upon a current impulse of one direction making the contact through the resistance to the battery, and repelling the armature, breaking this circuit, upon the reversal of the alternating current. Thus the current to the battery is in one direction only, and by means of the transformer of

moderate voltage. An ammeter is mounted on the outside of the case that permits the operator to judge when the battery

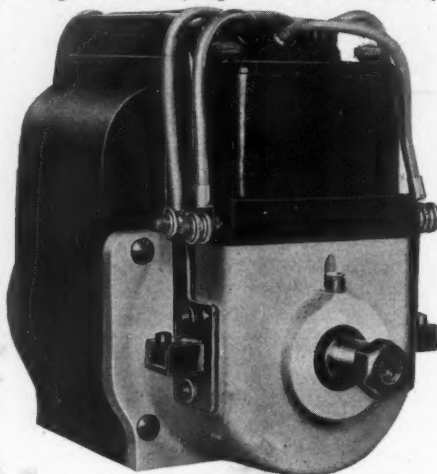


FIG. 1—REMY LIGHTING GENERATOR

is charged. Connection is made to the lighting circuit by means of a length of lamp cord and a plug to fit an ordinary lamp socket. The battery wires are connected to the binding posts, which appear on the lower front face of the device, below the ammeter.

### English Motor Phone

Brown Brothers, London, Eng., many of whose devices have been described in these columns, have brought out a loud-speaking motor phone for use in closed cars, which, as is to be expected of a British product, is very elaborate. It is in substance a complete uni-direction telephone outfit, consisting of a transmitter; which greatly resembles an ordinary desk phone cut down, a two-cell storage battery, a coil, and an amplifying receiver. The transmitter is fitted with a ring by which it is hung in a convenient position, within the car, and on the hard rubber handle, a button, which is used to connect the receiver and the transmitter. The wiring is permanent, while the instruments are inserted with plug connections. The receiver is very compact, and is screwed to the side of the car, with the horn opposite the driver's ear. The coil is very small and compact, and the battery is of 8-volts capacity. The ad-

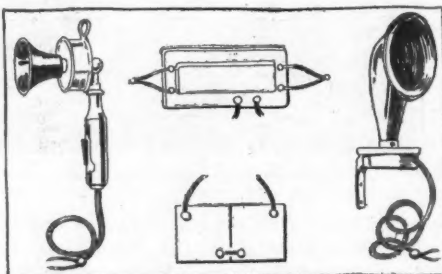


FIG. 3—BROWN MOTOR CAR TELEPHONE

## Development Briefs

vantages of this outfit, are that it is only necessary to speak in an ordinary conversational tone of voice to make oneself heard under any conditions. The phone transmits only when the button is pressed, so that the chauffeur is not permitted to beguile his time listening to the conversation inside, as he is obliged to do with the speaking tube. He receives his orders plainly, but cannot talk back. If desired, the receiver may be placed on the steering column directly beneath the wheel, as in cars where there is no side wall to the driver's compartment.

### Sealo Tire Treatment

To prevent leaking tubes, the Sealo Tire Co. has produced a substance for injection into the tire that is claimed to prevent leakage of air through punctures, small tube cuts, and to heal porous tubes. It is not claimed to prevent blow-outs, but it

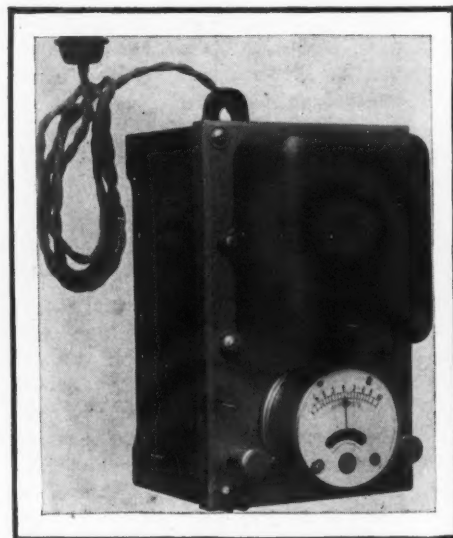


FIG. 4—WAGNER A. C. RECTIFIER

stands to reason that if a loss of air through small leaks is prevented the tire will never flatten and sustain the injuries attendant on running on soft tires; which are said to be the cause of nine-tenths of blowouts. Wear, or deep gashes alone, therefore, can cause a Sealo-treated tire to explode, according to the makers.

Sealo is simply a secret compound which is injected into the tire in the proportion of 1 part Sealo to 9 parts air, and the tire inflated to normal pressure. It is said to retain its fluid state indefinitely, and to be non-injurious to tires. It is about the consistency of thick cream, and is not sticky. When the car is at rest the fluid occupies the lowest portion of the tire, completely filling it from rim to tread. In this manner it reaches the side-walls of the tire when running slowly. When running at normal speed the compound is distrib-



# Novelties for Motoring

uted evenly about the inner surface of the tire. Upon any puncture of the tire the Sealo is forced through the aperture by the pressure of air behind it, where it hardens immediately, and is said to combine with the rubber of the tire, constituting a permanent closure.

## Lubro Anti-Freeze Fluid

Those hardy motorists who defy the hibernation edict of Jack Frost, and keep their cars in commission in zero weather, will be interested in Lubro, the product of the Lubro Oil Co., Cleveland, O. This is a commercial anti-freeze fluid, ready for use, said to be in many ways superior to home-made mixtures. Lubro is a secret compound which has been used in the locality of the factory for about 4 years, with evident success, and is now being offered for sale generally. It is composed of ingredi-

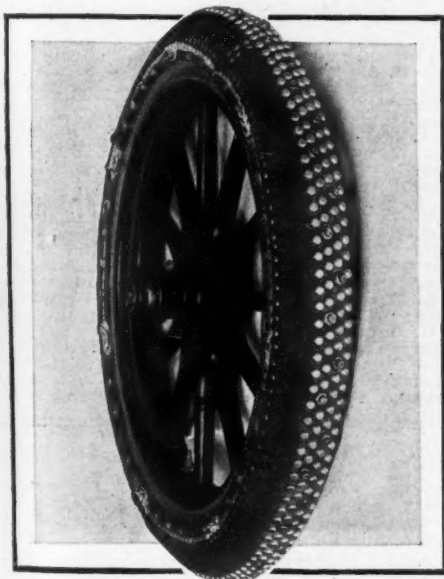


FIG. 5—NEW WOODWORTH SAFETY TREAD

ents which are harmless, it is claimed, and which serve to lubricate the pump, and are said to prevent the formation of rust and scale. Lubro is red in color, and its strength in solution may be readily determined. Leaks in the radiator are also easily detected, and garage men are not likely to drain out the radiator if the red color is observed. In a test conducted in Cleveland three bottles of the fluid were frozen in a solid cake of ice without congealing. At temperatures below zero the fluid will solidify, but in so doing will not expand. In use the radiator is drained and cleaned and 1 gallon of Lubro to 2½ gallons of water poured in. This solution is claimed to be sufficient for a season.

## Vulko-Fiberene

On the theory that the bulk of tire trouble is the direct or indirect result of loss of air through punctures, the Vulko-

Fiberene Co., Oklahoma City, Okla., offers Vulko-Fiberene as a preventative of punctures, without sacrificing the resiliency that is inseparable from air. This compound is claimed to be harmless to rubber or fabric, and is injected in such small quantities as to be a negligible impairment



FIG. 6—CONTROL SWITCH PLATE OF REMY LIGHTING SYSTEM

of the riding qualities of the car. The principle of action is as follows: As the tire revolves, the fluid is thrown out by centrifugal force in the form of a coating over the interior of the tire. A puncture is instantly closed, according to the claims of the manufacturers, by the pressure of the air through the fluid, which forces it into the opening, thus effecting a closure like a cork in a bottle.

If the object that has caused the puncture remains in the tire, no air is lost, is the claim, while if it is withdrawn the closure is made permanent. The claims of the manufacturer are broader than merely that the substance is harmless to the tire, as it is asserted that as the tube is kept moist within at all times, dry rot is prevented.

## Remy Lighting Dynamo System

Complete for use with 6-volt standard headlights, the Remy electric lighting system is shown in Fig. 7. This system is the product of the Remy Electric Co., Anderson, Ind. It consists of a dynamo, Fig. 1, a composite switch, fuse block and distribution block, and an ammeter.

The dynamo is of the differentially-compound wound type, the series winding opposing the shunt winding so as to produce a characteristic curve in which the maximum voltage is reached at moderate speed, above which no increase of output is produced, which makes all complicated slipping clutches, governors, etc., unnecessary. The armature is of the slotted drum type, with skewed slots, which have the effect of producing silence. A reverse current relay is placed above the commutator.

This consists of a differentially-wound electro-magnet, which closes a contact, connecting the generator with the battery, when the flow of current is from the generator to the battery, but which breaks it, when the output falls below the amount of the battery charge, thus preventing discharge of the battery through the armature.

Two wires connect the dynamo with the combination switch, fuse block and distributor block. From here two wires connect the cells of the battery in series with this circuit. The lamps are fed from the battery on the three-wire plan. This is necessary, because the output of the dynamo is 12 to 13 volts, this capacity doing away with all commutator troubles that result from low voltages, it is claimed. The lamps are of the standard 6-volt type and are connected to the neutral and positive or negative poles of the battery circuit, respectively, so that each receives but 6 volts from the battery. The switch, Fig. 6, is a single wing key, and provides positions wherein the side and tail, all, or head and tail lights are lit, with an off position at either end. The operator has no control over the charging of the battery, as the reverse current relay governs this entirely. The ammeter is provided as a telltale for the operator, informing him of any derangement in time to remedy it before the exhaustion of the battery. The ammeter lamp is connected in series with the tail light, so that it serves as a telltale on this member; any failure of the tail light causing the ammeter light to go out.

It is claimed that the dynamo generates sufficient current to light all of the lights at an average car-speed on high gear of about 13 miles per hour, and that its maximum output is reached at about 2,000 revolutions per minute. It is a peculiar feature of this outfit that with the lamps off the generator does not generate as much current as with them on.

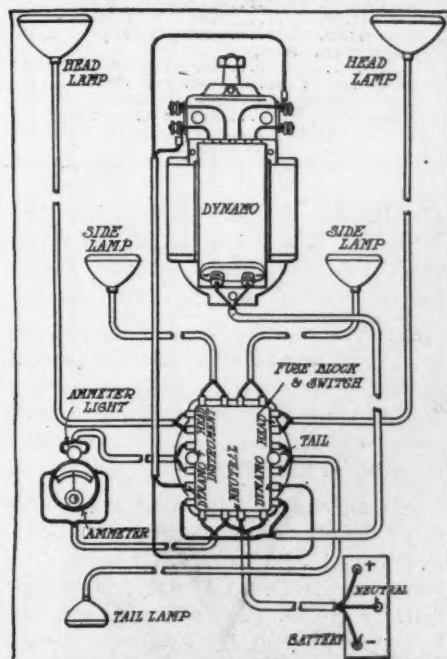


FIG. 7—PLAN OF REMY SYSTEM



# Brief Business Announcements



## Agencies Appointed by Motor Car and Truck Manufacturers

### PLEASURE CARS

Town—	Agent	Car	Town—	Agent	Car
Albany, Ga.	C. E. Fryer	Lozier	Lowell, Mass.	Lowell Auto Corp.	Oakland
Albany, N. Y.	James N. Kemp	Machine Works. Henderson	Malvern, Ia.	I. G. Bliss	Nyberg
Alliance, Neb.	N. C. Pederson	Mason	Manchester, N. H.	H. L. Taylor	Lozier
Archer, Neb.	W. T. Grace	Nyberg	McCools, Neb.	McCools Machine & Iron Works	Cartercar
Arapahoe, Neb.	G. W. Gearhart	Cartercar	Mechanicsburg, Pa.	G. C. Brenner	Henderson
Armington, Ill.	R. L. Kampf	Warren-Detroit	Memphis, Tenn.	Chickasaw Motor Car Co.	Moon
Attleboro, Mass.	W. B. Hollander	Metz	Minneapolis, Minn.	Fawkes Automobile Co.	Premier
Baltimore, Md.	Auto Outing Co.	Little	Mitchell, S. D.	Central Auto Supply Co.	Moon
Baltimore, Md.	Henderson Motor Sales Co.	Henderson	Mondovi, Wis.	G. P. Goddard, Jr.	Detroit
Binghamton, N. Y.	Earl Knickerbocker	Henderson	New Haven, Conn.	Knowles & Collins	Henderson
Blockton, Ia.	Aaa Terrill	Hupmobile	New Haven, Conn.	Stutz Auto Co.	Stutz
Brawley, Cal.	Donald & Lee	R. C. H.	Nowata, Okla.	H. G. Cheney	Lozier
Broken Bow, Neb.	Broken Bow Auto Co.	Cartercar	Oklahoma City, Okla.	Broadway Garage	Lozier
Bloomington, Ill.	J. E. Hanson	Warren-Detroit	Orleans, Neb.	Lideen Hardware Co.	Cartercar
Brockton, Mass.	Fisher-Nickerson Co.	Little	Palmer, Ia.	J. I. Johnson	Henderson
Bridgewater, Mass.	H. C. White	Overland	Paxton, Ill.	E. V. Kirby & J. B. Busey	Warren-Detroit
Brunswick, Ga.	F. D. Aiken's Sons	Henderson	Peoria, Ill.	Warren Motor Car Sales Co.	Warren-Detroit
Butte, Mont.	Montana Sales Co.	Lozier	Portland, Ore.	H. L. Mann	Henderson
Cedar Rapids, Ia.	Cedar Rapids Auto Co.	Lozier	Portland, Me.	Spears Auto Co.	Flanders
Chenoo, Ill.	M. M. Heintz	Warren-Detroit	Preston, Md.	Garris & Covy	Ford
Chebanse, Ill.	Kirk & Willet	Warren-Detroit	Providence, R. I.	J. B. Higginson	Henderson
Chicago	H. T. Farrar	R. C. H.	Pulaski, Ga.	George O. Franklin	Henderson
Cincinnati, O.	Victor Gluchowsky	White	Rosalie, Neb.	T. Lake	Mason
Cleveland, O.	Brandt Motor Car Co.	Moon	Salem, Va.	J. P. Saul, Jr., & F. L. Sheller	R. C. H.
Columbus, O.	Norman M. Johnston & J. W. Peiton	R. C. H.	Scribner, Neb.	William A. Kurz	Nyberg
Columbus, O.	S. W. Schott & Co.	Empire	Sharon, Pa.	W. C. DeForrest & Son	Lozier
Council Bluffs, Ia.	T. A. Mitchell	Studebaker	Sheboygan, Wis.	Sheboygan Auto & Supply Co.	Kisselkar
Crescent City, Ill.	Crescent Garage & Supply Co.	Warren-Detroit	Sheboygan, Wis.	John Cuddy	Baker
Denver, Colo.	Mathewson Auto Co.	Lozier	Sheboygan, Wis.	Clarence Garton	Cadillac
Des Moines, Ia.	Lagerquist Carriage & Auto Co.	Detroit	Shelbyville, Ind.	John H. Siefert	R. C. H.
Dixon, Neb.	R. Paul	Mason	Shenandoah, Ia.	Hand & Woodard	Rambler
Elizabethville, Pa.	Hombberger Brothers	R. C. H.	Shreveport, La.	Orme Motor & Transfer Co.	Moon
Emmitsburg, Md.	Emmitsburg Garage Co.	Ford	Springfield, Ill.	Ajax Motor Sales Co.	Henderson
Fall River, Mass.	Eckberg-Place Garage Co.	Franklin	Springfield, Mass.	R. A. McKee	Mitchell
Frederick, Md.	Ideal Garage	Ford	St. Louis, Mo.	T. J. Moss & J. B. Kavanaugh	Staver
Geneva, Neb.	W. H. Menking	Nyberg	St. Louis, Mo.	Lindell Automobile & Repair Co.	Cutting
Gilman, Ill.	Gilman Auto Sales & Service Co.	Warren-Detroit	St. Louis, Mo.	Bagnell Auto Co.	Lozier
Hagerstown, Md.	D. F. Hill Sons	Ford	Spencer, Neb.	W. P. Moore	Nyberg
Hamilton, O.	Hamilton Motor Car Co.	Moon	Superior, Neb.	Jack Galbreth	Rambler
Hancock, Md.	J. F. E. Fields	Ford	Superior, Neb.	L. R. Kesterson	Hupmobile
Harrisburg, Ill.	Cummins Motor Car Co.	Henderson	Taunton, Mass.	Short's Garage	R. C. H.
Hartford, Conn.	Howard D. Graves	Henderson	Texarkana, Tex.	Paul Jones	Moon
Hastings, Neb.	C. W. Jacobs	Cartercar	Toronto, Can.	American Motor Sales Co.	Henderson
Haverhill, Mass.	Smith & Johnson	Lozier	Urbana, Ill.	F. E. Stringer	Warren-Detroit
Hayworth, Ill.	F. A. Ball & Co.	Warren-Detroit	Valley, Neb.	Johnson & Clark	Studebaker
Hampstead, Md.	G. E. Cox	Ford	Washington, Pa.	T. H. Sutherland	Henderson
Honolulu, H. I.	Von Hamm-Young Co.	Lozier	Whitehall, Md.	Anderson & Wiley	Ford
Lake Forest, Ill.	Joe O'Neill	R. C. H.	Wichita Falls, Tex.	Motor Supply Co.	Lozier
Latrobe, Pa.	Latrobe Auto Co.	Lozier	Wilkes-Barre, Pa.	Thomas W. Haines, Jr.	Moon
Lowell, Mass.	Lowell Auto Corp.	Little	Worcester, Mass.	Cashman Auto Co.	Flanders

### TRUCKS

Allentown, Pa.	Allen Motor Co.	Stewart	Savannah, Ga.	Savannah Motor Car Co.	Stewart
Baltimore, Md.	R. Stuart Beaver	Stewart	St. Louis, Mo.	Federal Truck Co. of St. Louis	Stewart
Buffalo, N. Y.	Reinold Brothers	Stewart	Philadelphia, Pa.	Gomery-Schwartz Motor Car Co.	Stewart
Cleveland, O.	Henry E. Ricker & Co.	Stewart	Portland, Ore.	Coast Commercial Car Co.	Stewart
Edmonton, Alb., Can.	Northrup M. Service Co.	Stewart	Rochester, N. Y.	Mandery Motor Car Co.	Stewart
Houston, Tex.	Young & Dwire	Stewart	St. Paul, Minn.	Borge & Wharry Motor Co.	Stewart
Los Angeles, Cal.	Albert Biner	Stewart	Utica, N. Y.	Crim-Bronner Auto Co.	Stewart
Nashville, Tenn.	Martin & Crocker	Stewart	Wilkes-Barre, Pa.	Koon & Haller	Stewart
Salem, Mass.	North Shore Motors & Service Co.	Stewart	Wilmington, Del.	Gomery-Schwartz Motor Car Co.	Stewart

**CHICAGO**—A. M. Stryker has been added to the staff of the Stewart & Clark Mfg. Co. Mr. Stryker is now in charge of the advertising.

**Beloit, Wis.**—The Beloit Auto and Machinery Co. has been incorporated by C. F. Brewer, Jerome Davis and R. J. Davis to operate and conduct a garage, selling agency and repair works. The corporation is capitalized at \$10,000.

**Buffalo, N. Y.**—Henry Riker & Co., of Cleveland, have been appointed to act as state distributors for Ohio for the Stewart Motor Corporation, manufacturer of light delivery trucks. The Riker concern will have headquarters in Cleveland, where a large service station is to be fitted up on

Euclid avenue. The entire state will be covered by a number of traveling representatives working out of the Cleveland office.

**Bridgeport, Conn.**—M. V. Doud, formerly eastern sales manager for the Locomobile company, has formed the D. and H. Auto Distributing Co. here for the exclusive sale

**EDITOR'S NOTE**—Through an error in last week's Motor Age a large number of motor car dealers recently secured by the Stewart Motor Corporation, Buffalo, N. Y., were credited to the Lippard-Stewart Motor Car Co. of that city. These two concerns are entirely separate and distinct. The Stewart Motor Corporation, which began business in the early fall, is headed by T. R. Lippard and R. G. Stewart, both of whom previously withdrew from the Lippard-Stewart Motor Car Co. The dealers wrongly credited last week are republished properly credited this week.

of Kline cars. He will act as general manager and treasurer of the company and will be associated with John Heapley and G. H. Crauford in the business. Mr. Heapley is president and Mr. Crauford vice-president.

**Philadelphia, Pa.**—The Longstreth Motor Car Co., local distributor of the Alco line, is now located in its new sales and service building, 2126 Market street.

**Milwaukee, Wis.**—A. F. Timme, for several years vice-president and general manager of the Kopmeier Motor Car Co., 375-389 Summit avenue, Milwaukee, has established a plant at 315-319 Mineral street, Milwaukee, for the manufacture of the Shirley engine starter and auxiliary power



plant. P. H. Presentine, formerly business manager at Kopmeier's, is sales manager of the new Timme concern.

**Owen, Wis.**—Guy E. Huntington, of Pulaski, has leased the Elert-Barton building at Owen, and will open it as a garage and salesroom on December 15.

**San Antonio, Tex.**—Birdsong & Potcher-nick, Franklin dealers in this city, have just moved into a new and well-equipped salesroom and service station at 104 Avenue D, near the new Alamo Plaza.

**Milwaukee, Wis.**—Charles R. Johnson has been appointed manager of the Kopmeier Motor Co., 375-389 Summit avenue, representing the Fiat, Chalmers and Flanders electric. Mr. Johnson succeeds John McDonald.

**Fort Atkinson, Wis.**—A. E. Puerner has sold his garage and agency business at Fort Atkinson to the Hofmeister Motor Co., of Waterton, Wis., which will conduct it as a branch. Mr. Puerner retires because of ill health.

**Appleton, Wis.**—The Lion Liner Co. has been organized here to manufacture and market a newly patented inner liner for pneumatic tires. The company has been incorporated with an authorized capital of \$5,000. The owners are Anton Scheurle, Edward Greve and Fred C. Goodman.

**Milwaukee, Wis.**—John G. Wolleager has organized the Wolleager Sales Co., to continue the business of the Milwaukee branch of the Studebaker Corporation, of Milwaukee. Temporary quarters have been established in the salesrooms of the former Studebaker Milwaukee branch in the Stroh building, Michigan and Jackson streets,

and about December 1 the company will occupy the former Jonas-Cadillac garage at 417-421 Wells street.

**Philadelphia, Pa.**—J. Perkins, for several years superintendent of the Saurer motor truck factory of the International Motor Co. at Plainfield, N. J., has resigned his position there to become the superintendent of the Rushmore Dynamo Works, Plainfield.

**Chippewa Falls, Wis.**—The Jenkins Automobile Co., owned and managed by Judge F. M. Jenkins, is having plans prepared for a large new garage building, which will be the home of the Mitchell, Paige and Regal. The building will cost in the neighborhood of \$15,000.

**New York**—A. Gale Thomson, who for 16 years has represented the Joseph Dixon Crucible Co. of Jersey City in the Pacific coast territory, has been made sales manager for the motor car department of that company in the east. His headquarters are at 68 Reade street, New York city.

**Portage, Wis.**—The Portage Boat and Engine Co., manufacturing manual and power boats and motors, intends to build a large garage at Portage. The building will have ground dimensions of 40 by 132 feet, one story and basement, of fireproof construction. At present the motor car selling, repair and storage business is conducted at the boat factory.

**New York**—John B. Maus, recently connected with the Goodyear Tire and Rubber Co. as manager of its New York branch, has joined the United States Tire Co.'s selling forces in the capacity of special assistant to O. S. Tweedy, eastern district manager. Mr. Maus will have his headquarters

in New York, but will spend much of his time at the various branches in the eastern territory.

**Detroit, Mich.**—The Michigan Motor Car Co. has added to its sales department E. A. Welch, who becomes sales manager of the Michigan for the middle and eastern states. His territory includes all the states east of a line from Chicago to New Orleans. While Mr. Welch will keep his residence in Kalamazoo, he will travel this entire territory.

**Indianapolis, Ind.**—The Great Western Auto Sales Co. has been formed in Indianapolis by C. E. Williams and J. E. Williams and will distribute the Great Western line of cars in Indianapolis and vicinity. Quarters have been taken at 425 North Meridian street, where a full line of samples of the Great Western cars are being displayed.

**Sheboygan, Wis.**—The Sheboygan Auto and Supply Co. will start work on the proposed addition doubling its capacity. It was intended to commence building operations in the spring of 1913, but the company has just taken the Kisselkar agency, and this with the enlargement of the Studebaker line have made immediate action necessary.

**Toronto, Ont.**—Leonard J. Sievert, of Toronto, who was until recently connected with the Russell Motor Car Co., has been engaged to act as one of the Canadian representatives for Red Head spark plugs, Red Rib cable, E. G. bumpers and other Grossman specialties. His territory comprises that part of Canada as far west as Winnipeg, Man.

**Argyl, Pa.**—National Transportation Co., capital stock, \$100,000.

**Barker, N. Y.**—Progressive Motor Car Co., capital stock, \$30,000; incorporators, A. H. Tersleeson, J. B. Smith, H. S. Schuhr.

**Boston, Mass.**—Anderson Electric Car Co., capital stock, \$10,000; to deal in motor cars; incorporators, A. Weatherby, A. E. Yont, F. R. Keith.

**Boston, Mass.**—Pope Hartford Co., capital stock, \$100,000; to manufacture motor cars; incorporators, G. L. Dodd, C. W. Cousers, F. H. Lucas.

**Bridgeport, Conn.**—Locomobile Co. of Missouri, capital stock, \$10,000; incorporators, A. M. Marsh, D. S. Day, S. Stoddard.

**Brookline, N. Y.**—Coolidge Corner Garage Co., capital stock, \$5,000; directors, S. R. Davis, F. O. White, C. Brenner.

**Chicago**—L. C. Kuhnert, Jr., Co., capital stock, \$30,000; to manufacture engines and mechanical devices; incorporators, L. C. Kuhnert, Jr., C. O. Ryde, S. Adler.

**Chicago**—Molliter Tire Co., capital stock, \$100,000; incorporators, B. S. Lippincott, B. D. Towne, W. J. Higgins.

**Chicago**—Edgar Motor Livery Co., capital stock, \$10,000; incorporators, J. Edgar, E. A. Zimmerman, A. L. Meyers.

**Cleveland, O.**—Victor Brass Mfg. Co., capital stock, \$25,000; to manufacture motor car parts, etc.; incorporators, M. L. Tonne, W. J. Mahon, A. M. Fiebach, T. B. Pelton, F. M. Pelton.

**Daytona, Fla.**—Daytona Auto Supply Co., capital stock, \$1,000; incorporator, A. G. Hunt.

**Dunkirk, N. Y.**—Niagara Motors & Mfg. Co., capital stock, \$275,000; incorporators, E. J. West, D. W. Fry, M. M. Hedden.

**Fond du Lac, Wis.**—R. C. Wells Mfg. Co., capital stock, \$200,000; to manufacture motor car accessories.

**Ft. Wayne, Ind.**—Auburn Auto Co., capital stock, \$15,000; directors, F. Eckhart, A. Schultz, A. M. Horstman, L. Watson.

**Hartford, Conn.**—Auto-Owners' Supply Co., capital stock, \$50,000; incorporators, G. H. Peck, I. G. Cranton, R. S. Kilbourne.

**Mansfield, O.**—Brucker Motor Car Co., capital stock, \$5,000; to deal in motor cars and

## Recent Incorporations

accessories; incorporators, D. D. Brucker, W. F. Voegle, Jr., L. Brucker, A. E. Courtney, J. M. Ottinger.

**Marion, Ind.**—Marion Garage & Auto Co., capital stock, \$15,000; to manufacture motor car parts; incorporators, B. Custer, E. S. Paynter, J. P. Butterworth.

**Manhattan, N. J.**—Commercial Trucking & Terminal Corp., capital stock, \$150,000; to do trucking business; incorporators, W. H. Rankin, J. W. Wilks, W. Markle.

**Nashville, Tenn.**—White Motor Co., capital stock, \$10,000; incorporators, S. A. Craig, G. A. Puryear, W. H. Hyde, E. S. Craign, E. E. Wood.

**Naugatuck, Conn.**—Richardson Auto Co., capital stock, \$10,000; incorporators, J. E. Lundin, A. R. Richardson, O. E. Richardson.

**Newark, N. J.**—American Auto Radiator Co., capital stock, \$25,000; to manufacture motor car radiators; incorporators, M. Steiner, S. Goldstein, A. Marcus.

**New Brunswick, N. J.**—Middlesex County Garage & Sales Co., capital stock, \$100,000; incorporators, H. A. Boyd, J. Mershon, C. A. Oliver.

**Newcastle, Ind.**—Rose City Auto Co., capital stock, \$10,000; directors, F. E. Smith, C. W. Mouch, W. Byrket, Howard M. Van Matre.

**New York**—Auto Record Publishing Co., capital stock, \$10,000; to publish motor car magazine; incorporators, C. A. Loring, J. W. Buckmaster, I. E. Buckmaster.

**New York**—Auto Exchange & Equipment Co., capital stock, \$1,000; incorporators, H. Lanterbach, I. Lanterbach, C. A. Spencer.

**New York**—Gross Auto Rental Co., capital stock, \$5,000; incorporators, J. S. Gross, S. Gross, H. Strizver.

**New York**—Joseph H. Penders, capital stock, \$25,000; to manufacture and deal in motor cars; incorporators, J. H. Penders, E. Penders, C. Hahr.

**Philadelphia, Pa.**—Fortman Mfg. Co., capital stock, \$100,000; to manufacture motor cars.

**Pittsburgh, Pa.**—American Motor Fire Apparatus Co., capital stock, \$1,000,000; to manufacture motor car machinery and fire trucks; incorporators, P. F. B. Bithell, P. S. Chambers, T. L. P. Farr.

**Richmond, Va.**—Colonial Beach Motor Co., capital stock, \$1,000; incorporators, F. W. Alexander, G. Staples, H. W. B. Williams.

**Rochester, Ind.**—Rochester Garage & Machine Co., capital stock, \$15,000; to do repair business; incorporators, E. R. Creamer, O. C. Davisson, J. O. Gemin.

**Rotterdam, N. Y.**—General Vehicle Co., capital stock, \$10,000,000; incorporators, A. H. Jackson, S. L. Whitestone, J. F. Zoller.

**South Bend, Ind.**—South Bend Motor Car Co., capital stock, \$10,000; to manufacture motor cars; incorporators, J. D. J. Carnerman, A. C. Keeklenburg, H. Hammond.

**St. Louis, Mo.**—Auto Products Co., capital stock, \$25,000; to manufacture motor car parts and accessories; incorporators, W. W. Smoot, A. E. Smoot, E. B. Stinde.

**Toledo, O.**—Toledo Auto Shows Co., capital stock, \$10,000; to conduct motor car shows; incorporators, F. L. Mulholland, A. A. Atwood, H. W. Blevins, J. W. Banting, Guy R. Ford, S. Roberts.

**Toledo, O.**—Willys-Overland Co., capital stock, \$25,000,000; to manufacture motor cars; incorporators, W. Stewart, I. Kinsey, R. R. Scott, A. H. Smith, G. W. Bennett.

**Wabash, Ind.**—Sterling Absorber Co. to manufacture springs; directors, M. Tillman, C. Huff, J. Kaiser.

**White Plains, N. Y.**—General Rim Co., capital stock, \$150,000; to supply motor vehicles and accessories; incorporators, W. Kaul, R. W. Ashlaey, F. Oberkirsch.

**Wilmington, Del.**—Zee Zee Tire & Rubber Co., capital stock, \$1,000,000; to manufacture and deal in motor cars.



CAT  
DOG  
MOTOR  
PLUG

# The Motorist's Kindergarten



**EDITOR'S NOTE**—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car. The first article appeared October 10, 1912.

**I**N the so-called air-cooling systems used in motor cars the air is used directly to carry away the heat from the cylinders instead of through the medium of water, as in the water-cooling systems described last week. The simplest and earliest form of air-cooling arrangements is that in which the cylinders are cast with circular flanges around their outside so that the surface of the outside of the cylinder over which the air passes will be greater than it would be if the cylinder were left smooth. Air is made to pass around the cylinders, by a fan of some sort placed either in front or at the rear of the motor. In both cases the action of the fan is supplemented when the car is moving by the rush of air caused by the car's motion through it. As the air passes around the outside surface of the cylinder, the heat in the metal of the cylinder from the burning gas within it is given up to the air.

The larger the outside surface of the cylinder, the more air will come in contact with it, the more rapidly will the heat be taken away, and the cooler will the cylinder keep. So the chief effort in air-cooling is to make the radiating surface of the cylinder as large as possible, without having it take up too much room under the bonnet, and to make the air circulate as rapidly as possible.

Cylinders are made in several ways to increase their radiating surface. Sometimes, in addition to the circular flanges mentioned above, there are cast radial flanges on the head, so that the cylinder has the appearance of the one illustrated in the left-hand sketch in Fig. 10. This

## Air-Cooling Systems

practice is very common in the design of motor-cycle engines. In these engines the flanges are simply cast in the cylinder and left that way without further work on them, but in many motor-car engines the flanges after casting are machined down to make them thinner and deeper so as to increase the rate of radiation of the heat from them.

A very unique method is that employed in the motors of the Duryea buggy-type cars. The flanges are cast around the cylinder, and to them are fastened long flat spines or strips, radiating in every direction, so that the cylinder has very much the appearance of a cast-iron porcupine. This is illustrated at the center of Fig. 10. As the motor is so arranged that the air has direct access to the cylinders, and the spines offer an immense cooling surface, this makes a very efficient cooling system and the fan is not really needed.

One of the most thoroughly developed air-cooling systems is that which has been employed for so many years on the Franklin cars. This arrangement is illustrated at the right of Fig. 10, which shows one of the older four-cylinder Franklin types.

It will be seen that on the outside of the cylinders there are vertical flanges which extend straight out from the cylinder wall in all directions. Then, around each cylinder there is a sort of stove-pipe and connecting these stove-pipes there is a flat sheet-metal pan which is bent down at its edges and fastened to the frame in such a way that there is no connection between the upper part of the bonnet and

and the lower part of the engine except through the flues or stovepipes around the cylinders. Any air that passes from the upper to the lower part of the engine consequently passes between these vertical flanges.

Now, the lower part of the engine is made air-tight except for the flues around the cylinders and an opening at the rear to a very efficient form of suction fan mounted on the crankshaft. This draws air out of the lower compartment of the engine so that more air rushes in through the screen in the front and down through the flues around the cylinders to replace it. One of the great troubles in air cooling was due to the fact that in engines of more than one cylinder, the cylinders in front prevented those in the rear from receiving their full supply. This method, however, obviates that difficulty.

Similar to the system just described is the one employed on the Kelly trucks and known as the Frayer-Miller system. In this the air is forced by a comparatively powerful blower at the front end of the motor through a flue leading over the top of the engine. Jackets surrounding the cylinders open into this flue at their tops and are open to the air at the bottom. The cylinder heads are provided with vertical flanges much like those of the Franklin, but in addition the surface of the cylinder wall is increased by a large number of spines which are an integral part of the cylinder. The blower forces a blast of air at a rather high pressure into the flue above the motor and the only escape for it is through the air jackets, passing around the hot portion of the cylinder.

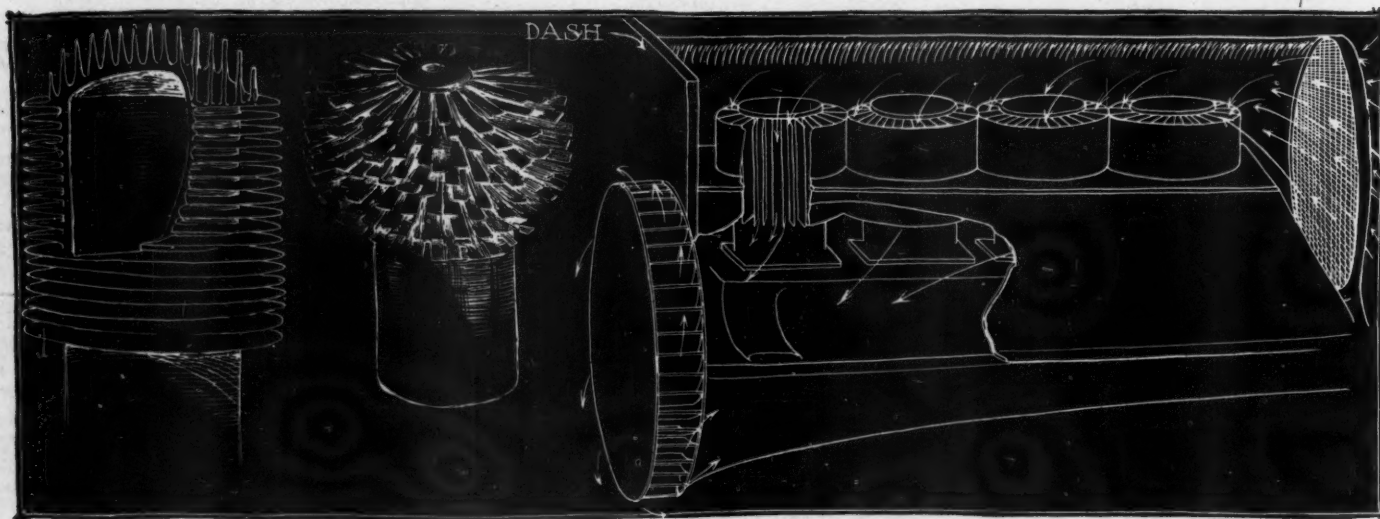


FIG. 10—THREE METHODS OF AIR-COOLING